**THE UNITED STATES DISTRICT COURT**
**FOR THE EASTERN DISTRICT OF TEXAS**
**MARSHALL DIVISION**

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|---|---|---|
| STRATASYS, INC., | § | |
| | § | |
| v. | § | CASE NO. 2:24-CV-00644-JRG |
| | § | |
| SHENZHEN TUOZHU TECHNOLOGY CO., LTD., SHANGHAI LUNKUO TECHNOLOGY CO., LTD., BAMBU LAB LIMITED, AND TUOZHU TECHNOLOGY LIMITED | § | |

**CLAIM CONSTRUCTION ORDER**

On December 9, 2025, the Court held a hearing to determine the proper construction of disputed terms in United States Patents No. 7,555,357, 8,562,324, 8,747,097, 9,168,698, 9,421,713, 9,592,660, 10,556,381, 10,569,466, 11,167,464, and 11,886,774.

Before the Court are the Opening Claim Construction Brief (Dkt. No. 93) filed by Plaintiff Stratasys, Inc., the Responsive Claim Construction Brief (Dkt. No. 105) filed by Defendants Shenzhen Tuozhu Technology Co., Ltd., Shanghai Lunkuo Technology Co., Ltd., Bambu Lab Limited, and Tuozhu Technology Limited (collectively, "Defendants" or "Bambu"), Plaintiff's reply (Dkt. No. 119), and Defendants' Notice of Supplemental Authority in Support of its Responsive Claim Construction Brief (Dkt. No. 137). Also before the Court is the parties' September 10, 2025 Joint Claim Construction and Prehearing Statement Pursuant to Patent L.R. 4-3 (Dkt. No. 78) and the parties' November 19, 2025 Joint Claim Construction Chart (Dkt. No. 126).

Having reviewed the arguments made by the parties at the hearing and in their claim construction briefing, having considered the intrinsic evidence, and having made subsidiary factual

findings about the extrinsic evidence, the Court hereby issues this Claim Construction Order. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc); *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015).

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## I. BACKGROUND

Plaintiff alleges infringement of United States Patents No. 7,555,357, 8,562,324, 8,747,097, 9,168,698, 9,421,713, 9,592,660, 10,556,381, 10,569,466, 11,167,464, and 11,886,774. Dkt. No. 93, Exs. A1–A8. Plaintiff submits that the patents-in-suit are "directed at various aspects of 3D printing." Dkt. No. 93 at 1.

The '466 Patent, titled "Tagged Build Material for Three-Dimensional Printing," issued on February 25, 2020, and bears an earliest priority date of October 29, 2012. The '464 Patent resulted from a continuation of the '466 Patent. Plaintiff submits that "[t]he '466 and '464 Patents address inefficiencies in 3D printing caused by the need for users to manually configure printing settings for each new material." Dkt. No. 93 at 2. The Abstract of the '466 Patent states:

> A supply of build material such as a spool or cartridge is instrumented with a data tag that includes information about the build material. A three-dimensional printer can read the information from the tag and determine how to use the build material during fabrication of a three-dimensional object.

The '324 Patent, titled "Networked Three-Dimensional Printing," issued on October 22, 2013. The '097 Patent, titled "Networked Three-Dimensional Printer With Three-Dimensional Scanner," issued on June 10, 2014. The '324 Patent and the '097 Patent are continuations of the same parent patent application, namely United States Patent Application No. 13/314,337, and both patents bear an earliest priority date of August 18, 2010. Plaintiff submits that these patents "are directed at networked 3D printing that allows users to monitor and manage the printing process." Dkt. No. 93 at 5. The Abstracts of the '324 Patent and the '097 Patent are the same and state:

> Three-dimensional fabrication resources are improved by adding networking capabilities to three-dimensional printers and providing a variety of tools for networked use of three-dimensional printers. Web-based servers or the like can provide a single point of access for remote users to manage access to distributed

> content on one hand, and to manage use of distributed fabrication resources on the other.

The '713 Patent, titled "Additive Manufacturing Method for Printing Three-Dimensional Parts with Purge Towers," issued on August 23, 2016, and bears a filing date of March 8, 2013. Plaintiff submits that "[t]he '713 Patent improves how 3D printers switch between different materials during printing." Dkt. No. 93 at 14. The Abstract of the '713 Patent states:

> A method for printing a three-dimensional part with an additive manufacturing system, the method including printing layers of the three-dimensional part and of a support structure for the three-dimensional part from multiple print heads or deposition lines, and switching the print heads or deposition line between stand-by modes and operating modes in-between the printing of the layers of the three-dimensional part and the support structure. The method also includes performing a purge operation for each print head or deposition line switched to the operating mode, where the purge operation includes printing a layer of at least one purge tower from the print head or deposition line switched to the operating mode.

The '357 Patent, titled "Method for Building Three-Dimensional Objects With Extrusion-Based Layered Deposition Systems," issued on June 30, 2009, and bears a filing date of January 31, 2006. Plaintiff submits that "[b]y adjusting material flow to match void regions' dimensions, the invention reduces porosity and preserves structural integrity of the printed object." Dkt. No. 93 at 17. The Abstract of the '357 Patent states:

> A method of forming a three-dimensional object using an extrusion-based layered deposition system, the method comprising generating a build path for building a layer of the three-dimensional object, where the build path defines a void region. The method further comprising generating at least one intermediate path in the void region, and generating a remnant path based at least in part on the at least one intermediate path.

The '660 Patent, titled "Heated Build Platform and System for Three Dimensional Printing Methods," issued on March 14, 2017, and bears a filing date of December 17, 2024. Plaintiff submits that "[t]he '660 Patent is directed at an improved 3D printing method with high-temperature thermoplastics by providing a heated build platform that solves the adhesion, warping,

and part-removal problems found in prior art." Dkt. No. 93 at 23. The Abstract of the '660 Patent states:

> An apparatus performing as a base for printing 3D objects using high temperature thermoplastics employing additive manufacturing methods is provided. The apparatus comprises a heated build platform, a thin removable plate secured on top of the build platform, a high temperature polymer coating applied over the removable plate, and surface treatment of high temperature polymer coating to maintain adhesion between 3D object and printing surface. Also, the removable plate has low coefficient of thermal expansion compared to build platform below it, for avoiding bowing of the plate as it is heated due to heated build platform, hence providing flat printing surface. The thin removable plate allows 3D objects to pop off the plate upon cooling, without damaging the polymer coating, the plate, or the object. It also allows for continuous operation of printing, while the plate is released for cooling, a new plate is installed for printing.

The '774 Patent, titled "Detection and Use of Printer Configuration Information," issued on January 30, 2024, and bears an earliest priority date of December 31, 2014. Plaintiff submits that the '774 Patent "addresses inefficiencies in 3D printing caused by the mismatch between a printer's configuration and the digital models it receives" by "enabling a printer to communicate its configuration information—such as hardware specifications, firmware version, or material capabilities—to a server or client device." Dkt. No. 93 at 28. The Abstract of the '774 Patent states:

> The hardware and software properties of a three-dimensional printer can be queried and applied to select suitable directly printable models for the printer, or to identify situations where a new machine-ready model must be generated. The properties may be any properties relevant to fabrication including, e.g., physical properties of the printer, printer firmware, user settings, hardware configurations, and so forth. A printer may respond to configuration queries with a dictionary of capabilities or properties, and this dictionary may be used to select suitable models, or determine when a new model must be created. Similarly, when a printable model is sent to the printer, metadata for the printable model may be compared to printer properties in the dictionary to ensure that the model can be fabricated by the printer.

Shortly before the start of the December 9, 2025 hearing, the Court provided the parties with preliminary constructions with the aim of focusing the parties' arguments and facilitating discussion. Those preliminary constructions are noted below within the discussion for each term.

## II. LEGAL PRINCIPLES

"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.'" *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)). Claim construction is clearly an issue of law for the court to decide. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970–71 (Fed. Cir. 1995) (*en banc*), *aff'd*, 517 U.S. 370 (1996). "In some cases, however, the district court will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period." *Teva*, 135 S. Ct. at 841 (citation omitted). "In cases where those subsidiary facts are in dispute, courts will need to make subsidiary factual findings about that extrinsic evidence. These are the 'evidentiary underpinnings' of claim construction that we discussed in *Markman*, and this subsidiary factfinding must be reviewed for clear error on appeal." *Id.* (citing 517 U.S. 370).

To determine the meaning of the claims, courts start by considering the intrinsic evidence. *See Phillips*, 415 F.3d at 1313; *see also C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). The intrinsic evidence includes the claims themselves, the specification, and the prosecution history. *See Phillips*, 415 F.3d at 1314; *C.R. Bard*, 388 F.3d at 861. Courts give claim terms their ordinary and accustomed meaning as understood by one of ordinary skill in

the art at the time of the invention in the context of the entire patent. *Phillips*, 415 F.3d at 1312–13; *accord Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003).

The claims themselves provide substantial guidance in determining the meaning of particular claim terms. *Phillips*, 415 F.3d at 1314. First, a term's context in the asserted claim can be very instructive. *Id.* Other asserted or unasserted claims can aid in determining the claim's meaning because claim terms are typically used consistently throughout the patent. *Id.* Differences among the claim terms can also assist in understanding a term's meaning. *Id.* For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. *Id.* at 1314–15.

"[C]laims 'must be read in view of the specification, of which they are a part.'" *Id.* at 1315 (quoting *Markman*, 52 F.3d at 979). "[T]he specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); *accord Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002). This is true because a patentee may define his own terms, give a claim term a different meaning than the term would otherwise possess, or disclaim or disavow the claim scope. *Phillips*, 415 F.3d at 1316. In these situations, the inventor's lexicography governs. *Id.* The specification may also resolve the meaning of ambiguous claim terms "where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone." *Teleflex*, 299 F.3d at 1325. But, "[a]lthough the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims." *Comark Commc'ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998)

(quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988)); *accord Phillips*, 415 F.3d at 1323.

The prosecution history is another tool to supply the proper context for claim construction because a patent applicant may also define a term in prosecuting the patent. *Home Diagnostics, Inc. v. Lifescan, Inc.*, 381 F.3d 1352, 1356 (Fed. Cir. 2004) ("As in the case of the specification, a patent applicant may define a term in prosecuting a patent."). "[T]he prosecution history (or file wrapper) limits the interpretation of claims so as to exclude any interpretation that may have been disclaimed or disavowed during prosecution in order to obtain claim allowance." *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 (Fed. Cir. 1985).

Although extrinsic evidence can be useful, it is "less significant than the intrinsic record in determining the legally operative meaning of claim language." *Phillips*, 415 F.3d at 1317 (citations and internal quotation marks omitted). Technical dictionaries and treatises may help a court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent. *Id.* at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert's conclusory, unsupported assertions as to a term's definition are entirely unhelpful to a court. *Id.* Generally, extrinsic evidence is "less reliable than the patent and its prosecution history in determining how to read claim terms." *Id.*

The Supreme Court of the United States has "read [35 U.S.C.] § 112, ¶ 2 to require that a patent's claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus, Inc. v. Biosig*

*Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014). "A determination of claim indefiniteness is a legal conclusion that is drawn from the court's performance of its duty as the construer of patent claims." *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347 (Fed. Cir. 2005) (citations and internal quotation marks omitted), *abrogated on other grounds by Nautilus,* 134 S. Ct. 2120. "Indefiniteness must be proven by clear and convincing evidence." *Sonix Tech. Co. v. Publ'ns Int'l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017).

## III. AGREED TERMS

In the September 10, 2025 Joint Claim Construction and Prehearing Statement, the parties submitted that "[t]he parties agree that all non-disputed terms should be construed to have their plain and ordinary meaning." Dkt. No. 78 at 2. During the course of briefing, the parties reached agreement as to one of the terms, and that agreement is set forth in Appendix A to this Claim Construction Memorandum and Order.

## IV. DISPUTED TERMS

### 1. "providing a three-dimensional printer that includes a tag sensor" and "providing a three-dimensional printer that includes a controller and a tag sensor"

| **"providing a three-dimensional printer that includes a tag sensor"** ('466 Patent, Claim 1) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | "providing a three-dimensional printer with an integrated tag sensor" |
| **"providing a three-dimensional printer that includes a controller and a tag sensor"** ('466 Patent, Claim 19) | |
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | "providing a three-dimensional printer that includes a controller and an integrated tag sensor" |

Dkt. No. 78, Ex. A at 1 & 2; *id.*, Ex. B at 1–2; Dkt. No. 126 at 2.

Shortly before the start of the December 9, 2025 hearing, the Court provided the parties with the following preliminary construction for these terms: "Plain Meaning."

(a) The Parties' Positions

Plaintiff argues that "nothing in the intrinsic record requires an 'integrated' tag sensor, whatever that might mean," and "[t]here is no lexicography, no disclaimer, and no basis for a POSITA to equate 'includes' with 'integrated.'" Dkt. No. 93 at 2.

Defendants respond that "Bambu's construction is necessary to clarify that a three-dimensional printer that 'includes' a tag sensor is materially different than a three-dimensional printer that, for example, has a tag sensor attached or connected." Dkt. No. 105 at 1. In particular, Defendants submit that "comparing the claims of the '466 Patent to the claims of the other patents in the same family shows that a three-dimensional printer that 'includes' a tag sensor is different than a three-dimensional printer 'connected' to or 'associated with' a three-dimensional printer." *Id.* Defendants also argue that "[e]ven if the specification describes an embodiment with an 'add-on' tag sensor, a given claim need not cover every embodiment or feature." *Id.* at 2 (citation omitted).

Plaintiff replies that "neither the intrinsic record nor any extrinsic evidence supports Bambu's construction," and "[a]lthough the related patents claim sensors 'associated', 'in communication', or 'communicatively associated' with other elements, none of those claims recite a sensor 'attached' or 'connected to' the printer as Bambu suggests." Dkt. No. 119 at 1 (citations omitted).

At the December 9, 2025 hearing, the parties presented oral arguments as to these terms. For example, Defendants argued that the use of an "add-on" tag sensor (rather than an integrated tag sensor) is covered by claims of the continuation '464 Patent.

(b) Analysis

Claim 1 of the '466 Patent recites (emphasis added):

> 1. A method, comprising:
> *providing a three-dimensional printer that includes a tag sensor*;
> receiving a request from a client over a network to fabricate an object on the three-dimensional printer, the three-dimensional printer coupled to a supply of a build material including a tag that stores at least one property of the build material;
> reading data from the tag with the tag sensor;
> providing the data from the tag to the client over the network, the data including at least one property of the build material;
> receiving one or more operational parameters from the client selected for use in controlling operation of the three-dimensional printer when fabricating the object with the build material having the at least one property stored in the tag; and
> fabricating the object with the build material according to the one or more operational parameters.

Defendants emphasize that the '464 Patent, which resulted from a continuation of the '466 Patent, recites: a "tag sensor *in communication* with a controller of a three-dimensional printer" ('464 Patent, Claim 1); "a tag sensor *communicatively associated* with the three-dimensional printer" ('464 Patent, Claim 12); and "using a tag sensor *associated* with a three-dimensional printer" ('464 Patent, Claim 19). Defendants also cite United States Patent No. 9,233,504, which is a parent of the '466 Patent and in which Claim 1 recites "a tag sensor *communicatively associated* with the three-dimensional printer."

"Where multiple patents derive from the same parent application and share many common terms, we must interpret the claims consistently across all asserted patents." *SightSound Techs., LLC v. Apple Inc.*, 809 F.3d 1307, 1316 (Fed. Cir. 2015) (citation and internal quotation marks omitted).

Although differences in claim language can sometimes be probative, the Federal Circuit has noted that even where different words are used in the same claim, let alone in different (albeit related) patents, "it is not unknown for different words to be used to express similar concepts, even though it may be poor drafting practice." *Bancorp Servs., LLC v. Hartford Life Ins. Co.*, 359 F.3d 1367, 1373 (Fed. Cir. 2004). Also, "[d]ifferent terms or phrases in separate claims may be construed to cover the same subject matter where the written description and prosecution history indicate that such a reading of the terms or phrases is proper." *Nystrom v. TREX, Inc.*, 424 F.3d 1136, 1143 (Fed. Cir. 2005).

Moreover, the specification discloses that a tag sensor can be an "add-on component":

> As shown in step 602, the method 600 may include providing a three-dimensional printer with a controller and a tag sensor. In one aspect, this may include providing a tag sensor as an *add-on component* to a three-dimensional printer and coupling the tag sensor to the controller for the three-dimensional printer. In another aspect, this may simply include providing a three-dimensional printer that is equipped with a suitable tag sensor.

'466 Patent at 20:64–21:4 (emphasis added); *see id.* at Fig. 3 (illustrating tag sensor 310 and printer 306).

Defendants respond by citing the principle that "[i]t is not necessary that each claim read on every embodiment." *Baran v. Med. Device Techs., Inc.*, 616 F.3d 1309, 1316 (Fed. Cir. 2010).

On balance, however, the word "including" simply cannot bear the load that Defendants are asking it to carry, particularly when read in light of the above-reproduced disclosure that a tag sensor can be an "add-on" component. Defendants' proposal of "integrated" should therefore be rejected. At the December 9, 2025 hearing, Defendants' alternatively proposed replacing "integrated" with "equipped with," but this alternative proposal is rejected for the same reasons (and, moreover, because it would potentially give rise to confusion regarding the meaning of "equipped with").

The Court therefore hereby expressly rejects Defendants' proposed construction, and no further construction is necessary. *See U.S. Surgical*, 103 F.3d at 1568 ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy."); *see also O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co., Ltd.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008); *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1207 (Fed. Cir. 2010) ("Unlike *O2 Micro*, where the court failed to resolve the parties' quarrel, the district court rejected Defendants' construction."); *ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1326 (Fed. Cir. 2012); *Summit 6, LLC v. Samsung Elecs. Co., Ltd.*, 802 F.3d 1283, 1291 (Fed. Cir. 2015); *Bayer Healthcare LLC v. Baxalta Inc.*, 989 F.3d 964, 977–79 (Fed. Cir. 2021).

The Court accordingly hereby construes "providing a three-dimensional printer that includes a tag sensor" and "providing a three-dimensional printer that includes a controller and a tag sensor" to have their **plain meaning**.

**2. "receiving one or more operational parameters from the client selected for use in controlling operation of the three-dimensional printer," "determining an operational parameter for configuring the three-dimensional printer," "determining an operational parameter," and "a processor configured to determine an operational parameter"**

| **"receiving one or more operational parameters from the client selected for use in controlling operation of the three-dimensional printer"** ('466 Patent, Claim 1) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | "receiving one or more operational parameters from the client automatically selected for use" |

| **"determining an operational parameter for configuring the three-dimensional printer"** ('466 Patent, Claim 19) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | "automatically determining an operational parameter" |
| **"determining an operational parameter"** ('464 Patent, Claim 1) | |
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | "automatically determining an operational parameter" |
| **"a processor configured to determine an operational parameter"** ('464 Patent, Claim 12) | |
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | "a processor configured to automatically determine an operational parameter" |

Dkt. No. 78, Ex. A at 2 & 3–4; *id.*, Ex. B at 1–2; *see* Dkt. No. 126 at 2–3.

Shortly before the start of the December 9, 2025 hearing, the Court provided the parties with the following preliminary construction for these terms: "Plain Meaning."

Plaintiff argues that "Bambu's construction excludes user intervention, without any basis," and "[n]othing requires automatic selection or determination." Dkt. No. 93 at 4. Plaintiff cites disclosure in the specification and also argues that "Bambu relies on the prosecution history of a different patent application (No. 14/064,974), which issued as the '504 Patent, but nothing in that record supports any disclaimer of claim scope." *Id.*

In its reply brief, Plaintiff argues that these terms should be given their plain meanings because Defendants briefed only their indefiniteness theories, which were contingent on a then-pending motion for leave to amend that the Court has denied. Dkt. No. 119 at 1.

At the December 9, 2025 hearing, the parties rested on their briefing without any oral arguments as to these terms.

Because Defendants' responsive claim construction brief presents no argument apart from indefiniteness arguments as to which the Court has denied leave (*see* Dkt. No. 118), the Court hereby construes "receiving one or more operational parameters from the client selected for use in controlling operation of the three-dimensional printer," "determining an operational parameter for configuring the three-dimensional printer," "determining an operational parameter," and "a processor configured to determine an operational parameter" to have their **plain meaning**.

**3. "processor configured to receive a three-dimensional model"**

| **"processor configured to receive a three-dimensional model"** ('324 Patent, Claim 1, 19) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | "a processor configured to receive a data structure representing the geometry of a three-dimensional object" |

Dkt. No. 78, Ex. A at 4; *id.*, Ex. B at 4; Dkt. No. 126 at 3.

Shortly before the start of the December 9, 2025 hearing, the Court provided the parties with the following preliminary construction: "a processor configured to receive data representing the physical form of a three-dimensional object." During the hearing, both sides were amenable to the Court's preliminary construction, stating on both sides that the parties had no concerns.

The Court therefore hereby construes "processor configured to receive a three-dimensional model" to mean **"a processor configured to receive data representing the physical form of a three-dimensional object."**

**4. "two-dimensional projection of the three-dimensional model"**

| **"two-dimensional projection of the three-dimensional model"** ('324 Patent, Claims 1, 3, 5, 6, 19) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | "two-dimensional image derived from a three-dimensional computerized model" |

Dkt. No. 78, Ex. A at 5; *id.*, Ex. B at 4; Dkt. No. 126 at 4.

Shortly before the start of the December 9, 2025 hearing, the Court provided the parties with the following preliminary construction: "two-dimensional image of the three-dimensional model or of an object fabricated therefrom."

(a) The Parties' Positions

Plaintiff argues that "[t]he disputed term is composed of common words that are easily understood," and "[n]othing in the intrinsic record constitutes lexicography or disclaimer . . . ." Dkt. No. 93 at 7. Plaintiff argues that Defendants' proposal of "derived from" improperly "excludes projections obtained from a 3D scanner, other data acquisition device, or a video camera." *Id.*

Defendants respond that "Plaintiff improperly narrows the disputed term to just include 'two-dimensional projection' and then describes alleged embodiments of just this term," and "Bambu's construction is consistent with the patent's description of three-dimensional printing which describes that an "object 112 may be fabricated in three dimensions by depositing successive layers of material in two-dimensional patterns *derived*, for example, from cross-section of a computer model or other computerized representation of the object 112." Dkt. No. 105 at 5 (quoting '324 Patent, 4:37–41). Defendants also submit that "Bambu's proposed construction is

also consistent with the notion that the two-dimensional projection can be obtained from use of a three-dimensional scanner." Dkt. No. 105 at 6.

Plaintiff replies that Defendants misread the specification and that "Bambu selectively plucks 'derived' from the specification while ignoring context." Dkt. No. 119 at 2.

At the December 9, 2025 hearing, the parties presented oral arguments as to this term. Defendants argued that the claim language at issue is directed to helping a user compare an actual build to an intended build. As an alternative to the Court's preliminary construction, Defendants proposed replacing "an object fabricated therefrom" with "an object to be fabricated therefrom."

(b) Analysis

Claim 1 of the '324 Patent, for example, recites (emphasis added):

> 1. A device comprising:
> a three-dimensional printer including a build volume;
> a network interface coupled to a data network;
> a video camera positioned to capture video of the build volume from a point of view; and
> a processor configured to receive a three-dimensional model through the network interface, and to control operation of the three-dimensional printer to fabricate the three-dimensional model as an object within the build volume of the three-dimensional printer, the processor further configured to provide a user interface to a remote user accessing the device through the network interface, and to present in the user interface an image of the build volume from the video camera and *a two-dimensional projection of the three-dimensional model from the point of view of the video camera.*

The specification discloses:

> The two-dimensional projection may be any suitable rendering, simulation, or other visualization of the model and its current state of completion. Thus for example the two-dimensional projection may be obtained from a three-dimensional scanner or other data acquisition device coupled to a processor of the three-dimensional printer. The two-dimensional projection may be an image of the object as simulated based upon operation of the three-dimensional printer, using, e.g., a tool path history or a current state of completion. The two-dimensional projection may be dynamically updated to correspond to a state of physical completion of the object in order to provide real time, or quasi-real time visual status information. *In one*

> *aspect, the two-dimensional projection may simply be a video image from the video camera.*
>
> * * *
>
> The processor may be configured to monitor operation of the three-dimensional printer based upon a comparison of the two-dimensional projection with the image of the build volume. Using this type of image analysis, it may be possible to track actual progress against predicted progress to identify equipment malfunctions or other interference that might cause the physical object to deviate from the model used to fabricate the physical object.

'324 Patent at 24:58–25:5 & 25:35–42 (emphasis added).

The specification thus discloses that a "two-dimensional projection" is not necessarily "derived from a three-dimensional computerized model" as Defendants propose but rather could be a video image. This is also consistent with Claim 6, which depends from Claim 1, reciting "wherein the two-dimensional projection is a video image from the video camera."

Defendants argue that the two-dimensional projection must be "derived from a three-dimensional computerized model" because "[t]he ability to compare predicted progress derived from the three-dimensional model with actual progress from the video camera[] is the described purpose of a two-dimensional projection." Dkt. No. 105 at 6 (citing *id.* at 25:35–42). At the December 9, 2025 hearing, Defendants highlighted the following statements by the patentee during prosecution:

> The applicant has devised a personal manufacturing device, e.g., a three-dimensional printer, configured for use as a remote network resource. In addition to receiving a model through a network interface and controlling the printer to fabricate a model, a processor provides a user interface that shows both a video of an object being manufactured and a three-dimensional model of the object. Further, in order for a remote user to monitor progress of fabrication in a meaningful way, the three-dimensional model is rendered in the user interface from the perspective of the video camera that provides the image, thus advantageously permitting side-by-side comparison by a remote user of the model and the resulting object. This feature is expressly claimed as a processor configured to "present in the user interface an image of the build volume from the camera *and a two-dimensional*

> *projection of the three-dimensional model from the point of view of the video camera*."

Dkt. No. 93, Ex. D-1, May 22, 2013 Amendment and Reply at 7 (SSYSBL000000360).

Defendants have persuasively argued, including at the December 9, 2025 hearing, that the two-dimensional projection is of the complete three-dimensional model (rather than a partial build thereof). This is evident from the claim language itself, which recites that the two-dimensional projection is "of *the* three-dimensional model." This understanding is reinforced by other claim language, too, because the antecedent basis for "the three-dimensional model" appears in the recital of "a processor configured to receive a three-dimensional model through the network interface." '324 Patent, Cl. 1; *see id.*, Cl. 19 ("receiving a three-dimensional model through the network interface"). This reinforces that the phrase "three-dimensional model" refers to a complete model because the claims use the phrase to refer to a model as received through the network interface. This can be achieved with an image from a video camera, however, so long as the image shows a completed build. Likewise, Defendants show no reason why a current "image of the build volume" could not be compared to an image of a previously completed build (of the same three-dimensional model that is being fabricated).

The Court accordingly hereby construes "two-dimensional projection of the three-dimensional model" to mean **"two-dimensional image of the three-dimensional model or of an object to be fabricated therefrom."**

**5. "pass/fail evaluation"**

| **"pass/fail evaluation"**<br>('097 Patent, Claim 11) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | Indefinite |

Dkt. No. 78, Ex. A at 5; *id.*, Ex. B at 6; Dkt. No. 126 at 4.

Shortly before the start of the December 9, 2025 hearing, the Court provided the parties with the following preliminary construction: "Plain Meaning."

(a) The Parties' Positions

Plaintiff argues that "[t]he term uses simple words with clearly understood meanings," and "[t]he disputed term is readily understandable by a POSITA, particularly given the specification of the '097 Patent, which states that a 'pass/fail evaluation' is one of 'a variety of imaging-based automatic inspection, process control, and/or robotic guidance functions for the three-dimensional printer.'" Dkt. No. 93 at 8 (citing '097 Patent at 6:34–50).

Defendants respond that "the patent does not provide any boundaries or criteria for the pass/failure evaluation 'of the object being fabricated within the build volume,'" and "the patent acknowledges various types of errors, including 'unrecoverable' ones and 'subtle' ones, but never identifies which are sufficient to warrant a 'fail' determination." Dkt. No. 105 at 6 & 7.

Plaintiff replies that a "pass/fail evaluation" is readily understood as "assessing the printed object against predefined criteria to determine whether fabrication should continue or stop." Dkt. No. 119 at 3.

At the December 9, 2025 hearing, the parties rested on their briefing without any oral arguments as to this term.

(b) Analysis

Defendants submit authority that "when a subjective term is used in a claim, the court must determine whether the patent's specification supplies some standard for measuring the scope of the term," and "[t]he standard must provide objective boundaries for those of skill in the art." *Semcon IP Inc. v. Louis Vuitton N. Am., Inc.*, No. 2:19-CV-00122-JRG, 2020 WL 2544774, at *6

(E.D. Tex. May 19, 2020) (citations and internal quotation marks omitted); *see Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2014).

The disputed term appears in Claim 11 of the '097 Patent, which depends from Claim 1. Claims 1 and 11 recite (emphasis added):

> 1. A three-dimensional printer including a build volume, the three-dimensional printer comprising:
>
> a three-dimensional scanner configured to capture three-dimensional information from an object being fabricated within the build volume during a print job executing on the three-dimensional printer;
>
> a machine vision system configured to capture and analyze image content from the three-dimensional scanner, thereby providing a status of the print job executing on the three-dimensional printer;
>
> a network interface configured to couple the three-dimensional printer in a communicating relationship with a data network; and
>
> a web server configured to transmit the status of the print job for display at a remote client through the network interface.
>
> * * *
>
> 11. The system of claim 1 wherein the machine vision system provide [*sic*] a *pass/fail evaluation* of the object being fabricated within the build volume.

As a threshold matter, Plaintiff notes that Defendants applied prior art to the plain meaning of this term in *Inter Partes* Review ("IPR") proceedings, but an IPR petition cannot assert indefiniteness. *See* 35 U.S.C. § 311(b); *see also Cuozzo Speed Tech., LLC v. Lee*, 136 S. Ct. 2131, 2141–42 (2016); *Samsung Elecs. Am., Inc. v. Prisua Eng'g Corp.*, 948 F.3d 1342, 1355 (Fed. Cir. 2020).

Nonetheless, a particular IPR petition statement by Defendant Shenzhen Tuozhu Technology Co., Ltd. is noteworthy as affirmatively interpreting the term "pass/fail evaluation":

> A POSITA would have recognized that in some instances, defects will be so severe that they cannot be corrected through additional additive or subtractive detailing. In such scenarios, it would have been beneficial to have the machine vision system provide an automatic pass/fail evaluation such that the fabrication process can be stopped (either automatically or by the remote user) as soon as an unrecoverable defect is detected . . . .

Dkt. No. 93, Ex. D-3, Dec. 23, 2024 Petition for *Inter Partes* Review of United States Patent No. 8,747,097 Pursuant to 35 U.S.C. §§ 311–319, 37 C.F.R. § 42, at 40 (citation omitted).

Also, the specification provides context for understanding "pass/fail" because the specification discloses:

> The sensor 134 may include may also include [*sic*] more complex sensing and processing systems or subsystems, such as a three-dimensional scanner using optical techniques (e.g., stereoscopic imaging, or shape from motion imaging), structured light techniques, or any other suitable sensing and processing hardware that might extract three-dimensional information from the working volume 114. In another aspect, the sensor 134 may include a machine vision system that captures images and analyzes image content to obtain information about the status of a job, working volume 114, or an object 112 therein. The machine vision system may support a variety of imaging-based automatic inspection, process control, and/or robotic guidance functions for the three-dimensional printer 100 including without limitation *pass/fail* decisions, error detection (and corresponding audible or visual alerts), shape detection, position detection, orientation detection, collision avoidance, and so forth.

'097 Patent at 6:34–50 (emphasis added). The specification also contrasts "successful" and "unsuccessful":

> The method may include notifying the requester of a *successful* completion of the print job, or the method may include notifying the requester if the print job *fails* to complete. In this communication of status information, the three-dimensional printer may also request further user input, such as by inquiring whether to try printing the object again, or whether to forward an *unsuccessful* print job to another resource.

*Id.* at 20:15–22 (emphasis added). The specification also refers to the potential for an "unrecoverable error":

> The processor may be configured to monitor operation of the three-dimensional printer based upon a comparison of the two-dimensional projection with the image of the build volume. Using this type of image analysis, it may be possible to track actual progress against predicted progress to identify equipment malfunctions or other interference that might cause the physical object to deviate from the model used to fabricate the physical object. For example, a temperature change in an extruder, an air bubble in a path of melted supply material, or a tool misstep might cause an *unrecoverable error* in a fabrication process. By comparing actual to

> expected two-dimensional or three-dimensional results, a fabrication process can be expeditiously aborted and restarted or otherwise addressed without waiting for completion and physical inspection of the constructed object. In addition, more *subtle fabrication errors* such as misalignment of layers, surface holes, inaccurate material build-ups or deposits, rotational distortion, and so forth may also be detected and address [*sic*] prior to completion of a build.

*Id.* at 25:35–53 (emphasis added).

Finally, Defendants' own expert testified as follows in the present case:

> Q. What is the invention being claimed in claim 11 of the '097 patent?
> [Objection to form]
> A. It's the invention of claim 1 with the additional limitation that the machine vision system, which is the system that evaluates pictures and videos, determines whether or not -- *it applies some set of criteria and determines whether or not the object being built meets or fails to meet those criteria*.

Dkt. No. 93, Ex. W, Wolfe dep. at 99:4–14 (emphasis added).

Defendants argue that a lack of reasonable certainty regarding "some set of criteria" (*id.*) gives rise to indefiniteness (Dkt. No. 105 at 8), but the claim language does not limit the criteria. Rather, the claim requires merely that some pass/fail evaluation is provided. Also, Defendants emphasize that one of the above-reproduced passages refers to "pass/fail decisions" as well as "error detection," arguing that the specification fails to explain how these are different. Dkt. No. 105 at 7. Reading the above-reproduced disclosures as a whole, however, the specification is reasonably clear that the presence of an error does not necessarily result in a fail.

Thus, the specification, Defendants, and Defendants' expert all demonstrate that "pass/fail evaluation" in the claim here at issue is reasonably clear. The Court therefore hereby expressly rejects Defendants' indefiniteness argument. Defendants present no alternative proposed construction, and no further construction is necessary.

The Court accordingly hereby construes "pass/fail evaluation" to have its **plain meaning**.

**6. "a machine vision system configured to capture and analyze image content"**

| **"a machine vision system configured to capture and analyze image content"** ('097 Patent, Claims 1, 9–12, 14–18) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | "machine vision system configured to capture and analyze one or more graphic pictures" |

Dkt. No. 78, Ex. A at 7; *id.*, Ex. B at 8.

Plaintiff argues that "the term 'image content' is a simple term with a plain meaning, [a]nd [Defendants' proposal of] 'graphic pictures' never appears in the intrinsic record." Dkt. No. 93 at 9.

Defendants respond that "[i]n order to preserve judicial resources and simplify claim construction, Bambu agrees that the term 'a machine vision system configured to capture and analyze image content' as used in the '097 Patent should have its plain and ordinary meaning." Dkt. No. 105 at 10.

This agreement is set forth in Appendix A to this Claim Construction Order.

**7. "misalignment of layers"**

| **"misalignment of layers"** ('097 Patent, Claim 18) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | Indefinite |

Dkt. No. 78, Ex. A at 6; *id.*, Ex. B at 8; Dkt. No. 126 at 4.

Shortly before the start of the December 9, 2025 hearing, the Court provided the parties with the following preliminary construction: "Plain Meaning."

(a) The Parties' Positions

Plaintiff argues that "[t]he term 'misalignment of layers' is not indefinite—it is both textually clear and technically understood by a POSITA," and "[t]he claim language provides clear context." Dkt. No. 93 at 10. Plaintiff urges that "[t]he plain language leaves no ambiguity: the machine vision system—not a user—is responsible for detecting misalignment." *Id.* Plaintiff also argues that "Bambu's argument seeking numerical threshold on the amount of misalignment is meritless," because "the claim does not require a threshold, [and] Bambu cannot inject one under the guise of 'indefiniteness.'" *Id.* at 11.

Defendants respond: "[T]he patent merely indicates that 'misalignment of layers' is a type of 'subtle fabrication error,' but provides no guidance regarding what makes an error 'subtle' or distinguishes 'misalignment of layers' from any other error. Any physical system will exhibit some inconsistency from layer to layer in a fabrication process, but the '097 Patent does not provide any guidance for when this inconsistency is sufficient to be considered a 'misalignment of layers.'" Dkt. No. 105 at 11. Defendants further argue: "Plaintiff makes irreconcilable arguments that (1) the term is definite because a computer system determines when layers are misaligned, and yet (2) Defendant is wrong for 'seeking a numerical threshold' for misalignment. But a computer system cannot determine misalignment without a numerical threshold of some kind, which the '097 Patent fails to provide." *Id.* at 12.

Plaintiff replies that this disputed term is "a straightforward phrase composed of simple, commonly understood words." Dkt. No. 119 at 3–4. Plaintiff also argues that "'[m]isalignment' simply refers to a lack of alignment, and 'layers' in 3D printing plainly refers to the successive deposits of material used for printing. *Id.* at 4. Plaintiff reiterates that "[t]he claims place the

evaluation squarely in the hands of a machine vision system—not a user—removing any concern about subjectivity." *Id.*

At the December 9, 2025 hearing, the parties rested on their briefing without any oral arguments as to this term.

(b) Analysis

As a threshold matter, Plaintiff notes that Defendants applied prior art to the plain meaning of this term in IPR proceedings, but an IPR petition cannot assert indefiniteness. *See* 35 U.S.C. § 311(b); *see also Cuozzo Speed*, 136 S. Ct. at 2141–42; *Samsung*, 948 F.3d at 1355. Defendants' position in the IPR proceedings therefore does not significantly affect the Court's analysis.

Turning to the claim language, Claim 18 of the '097 Patent depends from Claim 16, which in turn depends from Claim 1. Claims 1, 16, and 18 of the '097 Patent recite (emphasis added):

> 1. A three-dimensional printer including a build volume, the three-dimensional printer comprising:
>
> a three-dimensional scanner configured to capture three-dimensional information from an object being fabricated within the build volume during a print job executing on the three-dimensional printer;
>
> a *machine vision system* configured to capture and analyze image content from the three-dimensional scanner, thereby providing a status of the print job executing on the three-dimensional printer;
>
> a network interface configured to couple the three-dimensional printer in a communicating relationship with a data network; and
>
> a web server configured to transmit the status of the print job for display at a remote client through the network interface.
>
> * * *
>
> 16. The system of claim 1 wherein *the machine vision system* compares an actual three-dimensional result in the build volume with an expected three-dimensional result based upon a source model.
>
> * * *
>
> 18. The system of claim 16 *wherein the machine vision system is configured to detect a misalignment of layers.*

The parties appear to agree that "misalignment of layers" recited in the claim here at issue is determined by a machine vision system, not by observation of a user. To whatever extent this remains disputed, Plaintiff's arguments are persuasive that "misalignment of layers" is determined by a machine vision system. A dispute remains, however, as to whether this term is reasonably clear.

The specification discloses that an object can be formed by depositing layers of material, during which an error, such as "misalignment of layers," can occur:

> The x-y-z positioning assembly 108 may generally be adapted to three-dimensionally position the extruder 106 and the extrusion tip 124 within the working volume 114. Thus by controlling the volumetric rate of delivery for the build material and the x, y, z position of the extrusion tip 124, the object 112 may be fabricated in three dimensions by depositing successive layers of material in two-dimensional patterns derived, for example, from cross-sections of a computer model or other computerized representation of the object 112.
>
> * * *
>
> By comparing actual to expected two-dimensional or three-dimensional results, a fabrication process can be expeditiously aborted and restarted or otherwise addressed without waiting for completion and physical inspection of the constructed object. In addition, more subtle fabrication errors such as *misalignment of layers*, surface holes, inaccurate material build-ups or deposits, rotational distortion, and so forth may also be detected and address [*sic*] prior to completion of a build.

'097 Patent at 4:33–41 & 25:45–53 (emphasis added).

Regarding this disclosure, Defendants emphasize testimony by Plaintiff's expert regarding what would be a "subtle" misalignment of layers, in particular the expert's testimony that what is "subtle" could vary based on the end user, the application, or the size of the part:

> Q The determination of whether or not a part with subtle fabrication errors would be acceptable is application dependent?
> A Yes, it could depend on an application of a material, whether or not they were acceptable.
> Q Acceptable to whom?

> A Whoever the end user of the part was, whether it was prototype or if it's going to be used in an actual part or something.

Dkt. No. 105, Ex. 9, Oct. 3, 2025 Gall dep. at 69:3–13; *see id.* at 83:5–12 ("it would depend on the application"), 92:23–93:3 ("your units would depend on a scale of your part") & 96:21–97:2 ("it could use comparisons"); *see also id.* at 75:21 (discussing "spaghettification" as an example of "extreme misalignment of layers").

Nonetheless, Defendants' own expert agreed in this case that a person of ordinary skill in the art would "understand what the general concept of misalignment of layers means" (albeit "[a]s a general concept but not as a specific invention"). Dkt. No. 93, Ex. W, Oct. 2, 2025 Wolfe dep. at 106:21–107:4.

Also, "absolute or mathematical precision is not required." *Interval Licensing*, 766 F.3d at 1370. Moreover, because the claim recites that this determination would be made by a machine vision system rather than by a human being observing the operation of the machine, this term does not "depend[] on the unpredictable vagaries of any one person's opinion." *Id.* at 1371. On balance, the parameters of what a machine vision system would deem to be a "misalignment of layers" is a fact-intensive, implementation-specific inquiry and is a matter of line-drawing (literally as well as figuratively) as part of an infringement analysis, not as part of claim construction. *See PPG Indus. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1355 (Fed. Cir. 1998) ("after the court has defined the claim with whatever specificity and precision is warranted by the language of the claim and the evidence bearing on the proper construction, the task of determining whether the construed claim reads on the accused product is for the finder of fact"); *see also Acumed LLC v. Stryker Corp.*, 483 F.3d 800, 806 (Fed. Cir. 2007) ("[t]he resolution of some line-drawing problems . . . is properly left to the trier of fact") (citing *PPG*, 156 F.3d at 1355); *Eon Corp. IP Holdings LLC v. Silver*

*Spring Networks, Inc.*, 815 F.3d 1314, 1318–19 (Fed. Cir. 2016) (citing *PPG*, 156 F.3d at 1355; citing *Acumed*, 483 F.3d at 806).

The Court therefore hereby expressly rejects Defendants' indefiniteness argument. Defendants present no alternative proposed construction, and no further construction is necessary.

The Court accordingly hereby construes "misalignment of layers" to have its **plain meaning**.

**8. "web server" and "server"**

| **"web server"** ('097 Patent, Claims 1, 4, 5) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | "a hardware or software system that transmits one or more web pages over a network" |
| **"server"** ('097 Patent, Claims 1, 4, 5) | |
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | "software or hardware that provides services in response to a client request" |

Dkt. No. 78, Ex. A at 7; *id.*, Ex. B at 6–7; Dkt. No. 126 at 4.

Shortly before the start of the December 9, 2025 hearing, the Court provided the parties with the following preliminary constructions: "web server" means "hardware, software, or a combination thereof, that provides service to a client over a network"; and "server" has "[n]o separate construction from 'web server.'"

(a) The Parties' Positions

Plaintiff argues that "[t]he terms 'web server' and 'server' are well-known and nothing compels importing limitations from the specification into the claims." Dkt. No. 93 at 12 (citation

omitted). Plaintiff submits that "a 'web server' provides access over the web for networked devices and transmits the print job status for display at a remote client." *Id.*

Defendants respond that "[p]roviding services in response to a client request is precisely what makes software or hardware a 'server,' as reflected throughout various technical dictionaries . . . ." Dkt. No. 105 at 8. Defendants argue: "A 'server' provides services in response to a client request. A 'web server' is a specific type of server that transmits one or more web pages over a network. The addition of 'web' to the phrase simply indicates the type of service (transmitting web pages) that is provided in response to a client request." *Id.* at 9. Defendants also respond that "Plaintiff wants to read out the word 'web' but that would ignore the specification consistently describing a 'web server' by its function of providing web pages." *Id.*

Plaintiff responds that "[i]f Bambu's construction of 'server' is applied, there is no remaining use of 'web server' to apply Bambu's construction for that term, and vice-versa." Dkt. No. 119 at 4.

At the December 9, 2025 hearing, the parties presented oral arguments as to these terms. Plaintiff was amenable to the Court's preliminary constructions. Defendants argued that the Court's preliminary construction for "web server" would be a proper construction for "server," but not for "web server," because a "web server" is a particular type of "server." Defendants also argued that if merely transmitting information were sufficient, then there would have been no reason for the patentee to have recited anything more than the "network interface configured to couple the three-dimensional printer in a communicating relationship with a data network" that is set forth in the penultimate limitation of Claim 1 of the '097 Patent.

(b) Analysis

Claims 1, 4, and 5 of the '097 Patent recite (emphasis added):

> 1. A three-dimensional printer including a build volume, the three-dimensional printer comprising:
>
> a three-dimensional scanner configured to capture three-dimensional information from an object being fabricated within the build volume during a print job executing on the three-dimensional printer;
>
> a machine vision system configured to capture and analyze image content from the three-dimensional scanner, thereby providing a status of the print job executing on the three-dimensional printer;
>
> a network interface configured to couple the three-dimensional printer in a communicating relationship with a data network; and
>
> a *web server* configured to transmit the status of the print job for display at a remote client through the network interface.
>
> * * *
>
> 4. The system of claim 1 wherein the *web server* is configured to host a remote user of the three-dimensional printer through the network interface.
>
> 5. The system of claim 1 wherein the *web server* displays status information from one or more sensors of the three-dimensional printer.

As a threshold matter, all three of the claims at issue recite "web server." Defendants have not identified any usage in this patent of the word "server" apart from the word "web." The Court therefore construes only "web server."

As for the proper construction, the claims recite a "web server" that can transmit status, that can host a remote user through a network interface, and that can display status information. These claims do not require this functionality to be accomplished through use of a "web page."

On one hand, the specification discloses web pages provided by a "web server":

> The video camera may provide a remote video feed through the network interface 136, which feed may be available to remote users through a user interface maintained by, e.g., remote hardware such as the print servers described below with reference to FIG. 3, or within a *web page provided by a web server* hosted by the three-dimensional printer 100.
>
> * * *
>
> The user interface may be maintained by a locally executing application on one of the client devices 306 that receives data and status information from, e.g., the printers 304 and print servers 308 concerning pending or executing print jobs, and

> creates a suitable display on the client device 306 for user interaction. In other embodiments, the user interface may be remotely served and presented on one of the client devices 306, such as where a print server 308 or one of the three-dimensional printers 304 includes *a web server that provides information through one or more web pages or the like* that can be displayed within a web browser or similar client executing on one of the client devices 306.

'097 Patent at 6:24–30 & 8:58–9:3 (emphasis added).

> On the other hand, the specification also discloses other examples:
>
> As shown in step 710, the method 700 may include transmitting status information over the data network upon completion of the object. This may, for example, include data presented through the user interface, or any other status information or summary thereof. For example, the status information may include a digital image from the video camera, which may be transmitted with an *electronic mail* communication confirming completion of the object. More generally, status information may include any of the status information described above, and may be transmitted to a user through an *electronic mail communication, instant messaging text message, or any other suitable communication medium.*

'097 Patent at 25:6–17 (emphasis added). Also, the specification refers to providing "web-based access." *Id.* at 9:15–17 & 12:28–30.

Defendants' proposal of a "web page" is thus a specific feature of a particular disclosed embodiment that should not be imported into the claims. *See Phillips*, 415 F.3d at 1323. Defendants cite a dictionary definition of "web server" that refers to web pages. *See* Dkt. No. 105, Ex. 3, *Wiley Electrical and Electronics Engineering Dictionary* 858–59 (2004) (BAMBU-00189947–48) (defining "Web server" as: "A server, such as an HTTP server, within the global system of servers which comprise the World Wide Web. The Web pages users wish to access over the Internet are provided by Web servers."). This is evidence that web pages are provided by web servers, but this does not establish that a "web server" must necessarily provide web pages rather than potentially some other service. Defendants also cite a definition of "web server" as "a computer that stores the collection of web pages that make up a website." *Id.*, Ex. 8, *Dictionary of Computing* 358 (6th ed. 2010) (BAMBU-00189927). This extrinsic evidence, however, is

outweighed by the above-reproduced intrinsic disclosure of "a web server that provides information through one or more web pages *or the like* . . . ." *Id.* at 8:67–9:1 (emphasis added). Also, "[a] claim should not rise or fall based upon the preferences of a particular dictionary editor, or the court's independent decision, uninformed by the specification, to rely on one dictionary rather than another." *Phillips*, 415 F.3d at 1322.

As for Defendants' proposal that a server must operate "in response to" client requests, Plaintiff argues that "the patent describes transmitting information without requiring a client request." Dkt. No. 119 at 4 (citing '097 Patent at 23:43–51). On one hand, Defendants persuasively submit that "server" is a well-established term in the relevant art and that operating in a server-client relationship is an essential feature of a "server." *See* Dkt. No. 105, Ex. 3, *Wiley Electrical and Electronics Engineering Dictionary* 698 (2004) (BAMBU-00189946) ("2. Within a network with a client/server architecture, a computer and/or program which responds to requests made by clients."); *see also id.*, Ex. 4, *Telecom Dictionary* 488 (2007) (BAMBU-00189940) ("A computer that can receive, process, and respond to an end user's (client's) request for information or information processing."); *id.*, Ex. 5, *Webster's New World Telecom Dictionary* 434 (2008) (BAMBU-00189943) ("In a client/server network architecture, a machine designated as to serve the needs of client machines."); *id.*, Ex. 6, *Microsoft Computer Dictionary* 474 (5th ed. 2002) (BAMBU-00189934) ("1. On a local area network (LAN), a computer running administrative software that controls access to the network and its resources, such as printers and disk drives, and provides resources to computers functioning as workstations on the network. 2. On the Internet or other network, a computer or program that responds to commands from a client. For example, a file server may contain an archive of data or program files; when a client submits a request for a file, the server transfers a copy of the file to the client."); *id.*, Ex. 7, *Newton's Telecom Dictionary*

829 (24th ed. 2008) (BAMBU-00189937) ("Software definition of server: A server is a program which provides some service to other (client) programs. The connection between a client program and the server program is traditionally by message passing, often over a local area or wide area network, and uses some protocol to encode the client's requests and the server's responses. Any given program may be capable of acting as both a client and a server, perhaps switching its role based on the nature of the connection. The terms 'client' and 'server' simply refer to the role that the software program performs during a specific connection.").

On the other hand, whereas Defendants propose that a "server" must provide a service "in response to a client request," the specification discloses that a service can be provided to clients by using "'push' technologies":

> It will be understood that while RSS ("RDF Site Summary," a.k.a., "Really Simple Syndication") provides one useful platform for syndicating content including three-dimensional models, any suitable technology or combination of technologies may also or instead be employed, including 'push' technologies that forward notifications to clients and/or 'pull' technologies that explicitly request updates on any suitable regular or ad hoc basis.

'097 Patent at 23:43–51.

The Court therefore rejects Defendants' proposal of "in response to," which would require that services be provided to clients only in response to client requests.

As for Defendants' argument that their proposal is necessary so as to give "web server" meaning beyond the separate recital of "a network interface configured to couple the three-dimensional printer in a communicating relationship with a data network," this argument is unpersuasive because the "network interface" limitation recites "coupl[ing]" but recites no limitations regarding transmissions or services. The "web server" limitation thus adds a meaningful limitation to the claims without being limited to web pages and without being limited to responding to client requests.

Finally, the recital of the web server transmitting "through the network interface" provides context for understanding that a web server provides service *over a network*.

The Court accordingly hereby construes these disputed terms as set forth in the following chart:

| Term | Construction |
|---|---|
| "web server" | **"hardware, software, or a combination thereof, that provides service to a client over a network"** |
| "server" | (No construction apart from "web server") |

**9. "deposition line" and "stand-by mode"**

| **"deposition line"** ('713 Patent, Claims 1, 2) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | "a line that heats and deposits material" |
| **"stand-by mode"** ('713 Patent, Claims 1, 2) | |
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | "a mode in which the print head or deposition line is not heating any material for extrusion" |

Dkt. No. 78, Ex. A at 8–9; *id.*, Ex. B at 9–10; Dkt. No. 126 at 4.

Shortly before the start of the December 9, 2025 hearing, the Court provided the parties with the following preliminary constructions: "deposition line" means "a line that deposits material"; and "stand-by mode" means "mode in which a print head or deposition line is not prepared to deposit material."

(a) The Parties' Positions

Plaintiff argues that these terms have well-known meanings in the relevant art, and "nothing in the intrinsic record constitutes lexicography or disclaimer." Dkt. No. 93 at 14 & 15. Plaintiff urges that "nothing *requires* heating and Bambu has provided no justification for its impermissible attempt to read these embodiments into the claims." *Id.* at 15.

As for "deposition line," Defendants respond that "[t]he patentee acted as a lexicographer in coining the term, which does *not* have an ordinary meaning to a POSITA." Dkt. No. 105 at 13 (emphasis added). Defendants argue that "the '713 Patent defines a 'deposition line' by distinguishing what it is not," and "[w]hat distinguishes a 'deposition line' from a 'guide tube' is the heating process, which enables the 'deposition line' to actually deposit material rather than merely transport it." *Id.* Defendants urge that "Stratasys mistakenly claims that heating is only required in some embodiments, but that assertion is based solely on boilerplate words, not on any specific embodiment, and thus entitled to little weight." *Id.* at 14 (citation omitted).

As for "stand-by mode," Defendants respond that "[t]he meaning of 'stand-by mode' varies from machine-to-machine, such that a POSITA would only understand the term in the context of the '713 Patent," and Defendants argue that this patent uses "stand-by mode" to refer to when the print head is cooler than when the print head is extruding material. *Id.* at 15.

Plaintiff replies that "nothing precludes the 'guide tube' from being part of the 'deposition line.'" Dkt. No. 119 at 5. Plaintiff also argues "even if the claims were limited to FDM (they are not) Defendants provide no explanation why any heating must happen in the deposition line." *Id.*

At the December 9, 2025 hearing, the parties presented oral arguments as to these terms. For example, Defendants argued that "deposition line" is a coined term and that the specification consistently refers to heating. Plaintiff maintained that no heating is required, and in response to

the Court's preliminary constructions Plaintiff proposed that "deposition line" could alternatively be construed to mean "a line that is used for depositing material," arguing that a "deposition line" can be used indirectly, such as by delivering material to a print head.

(b) Analysis

Claim 1 of the '713 Patent recites (emphasis added):

> 1. A method for printing a three-dimensional part with an additive manufacturing system, the method comprising:
>
> printing layers of the three-dimensional part and of a support structure for the three-dimensional part from multiple print heads or *deposition lines* using a layer-based, additive manufacturing technique;
>
> switching the print heads or *deposition line* between *stand-by modes* and operating modes in-between the printing of the layers of the three-dimensional part and the support structure;
>
> performing a purge operation for each print head or *deposition line* switched to the operating mode, the purge operation comprising printing at least one purge tower in a layer-by-layer manner, wherein the layers of the at least one purge tower are printed from the print head or *deposition line* switched to the operating mode.

On one hand, the specification discloses that a "stand-by mode" is "cooled down" relative to an operating mode:

> When printing with multiple print heads (or multiple deposition lines), each print head or deposition line is preferably switchable between an "operating mode" and a "stand-by mode". The operating mode is preferably a mode in which a liquefier assembly of the print head to be heated [*sic*] to its set point operating temperature(s) to generate a desired thermal gradient for melting the part or support material. In comparison, *the stand-by mode is preferably a mode in which the liquefier assembly of the print head is cooled down from its operating mode to prevent its part or support material from thermally degrading, oozing or dripping out.*
>
> Additionally, in some embodiments, when switching between the operating mode and the *stand-by mode*, one or more of the print heads are may be [*sic*] lifted, pivoted, or otherwise moved relative to the build plane and/or each other . . . .

'713 Patent at 4:1–16 (emphasis added).

On the other hand, Claim 11 of the '713 Patent expressly recites "bringing the first print head or deposition line from the stand-by mode to the operating mode comprises *heating* a liquefier

assembly of the first print head or deposition line." Although Claim 11 depends from Claim 10, neither of which are presently at issue, Claim 11 demonstrates that the patentee knew how to recite a heating limitation.

Also, Defendants' expert, in an IPR proceeding regarding the '713 Patent, has testified that "one example of standby mode is cooling" and that "in some cases standby mode doesn't incorporate the variable of temperature at all because some materials don't require heating to be printed." Dkt. No. 93, Ex. T, Aug. 29, 2025 Hickner dep. (IPR2025-00321) at 91:4–8 & 92:8–12. Likewise, Defendants' expert also testified:

> Q Do you believe that a person of ordinary skill in the art would understand that a deposition line has to be a line that heats and deposits material?
>
> A So one example of a deposition line, the deposition line includes a nozzle and the deposition line heats and deposits out of that same nozzle. But in additive manufacturing the switching or the deposition doesn't always encompass heating. It depends on the material. Some materials aren't heated.

*Id.* at 86:1–14.

Defendants argue that whereas these statements by their expert refer to additive manufacturing in general, the '713 Patent is limited to Fused Deposition Modeling ("FDM"), which involves heating. The specification discloses that "[s]uitable additive manufacturing systems for system 10 include extrusion-based systems developed by Stratasys, Inc., Eden Prairie, Minn. under the trademarks 'FDM' and 'FUSED DEPOSITION MODELING'" (*id.* at 6:1–4), but Defendants do not persuasively demonstrate that the claims of the '713 Patent are limited to FDM. Rather, this is a disclosed embodiment that should not be imported into the claims. *See Phillips*, 415 F.3d at 1323. Also, the inventor declaration cited by Defendants (submitted by Plaintiff in IPR proceedings) discusses FDM and heating with reference to a particular FDM printer that the named inventors designed. Dkt. No. 105, Ex. 12, Sept. 8, 2025 Lason Decl. at ¶ 13. This evidence

pertains to a particular system developed by the named inventors and does not warrant limiting the scope of the claims. Defendants' submission of extrinsic evidence regarding FDM is therefore unpersuasive. *See* Dkt. No. 105, Exs. 14–17 & 19–20.

The *Power Integrations* and *Rembrandt* cases cited by Defendants found that particular claims should be limited where the specifications there at issue provided no indication of any alternative design. *In re Power Integrations, Inc.*, 884 F.3d 1370 (Fed. Cir. 2018); *Rembrandt Techs, LP v. Cablevision Sys. Corp.*, No. 2012-1022, 496 F. App'x 36 (Fed. Cir. Sept. 13, 2012). The applicable principle, however, is that the Court of Appeals for the Federal Circuit has "expressly rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment." *Phillips*, 415 F.3d at 1323. And, again, Defendants' own expert has acknowledged that some materials for additive manufacturing do not require heating. Dkt. No. 93, Ex. T, Aug. 29, 2025 Hickner dep. (IPR2025-00321) at 86:1–14, 91:4–8 & 92:8–12. Defendants' argument that "[w]hat distinguishes a 'deposition line' from a 'guide tube' is the heating process" (Dkt. No. 105 at 13) is therefore also unavailing.

On balance, the specification refers to a lower temperature as an example, as reproduced above. '713 Patent at 4:1–16. Defendants' proposal of "not heating" is therefore rejected. Instead, the specification uses the term "stand-by mode" merely to refer to a mode in which a deposition line is not prepared to deposit material.

As for the construction of "deposition line," Defendants urge that this is a so-called "coined" term that does not have any established meaning outside of the '713 Patent. "Idiosyncratic language, highly technical terms, or terms coined by the inventor are best understood by reference to the specification." *See Intervet, Inc. v. Merial Ltd.*, 617 F.3d 1282,

1287 (Fed. Cir. 2010) (citing *Phillips*, 415 F.3d at 1315); *see also Indacon, Inc. v. Facebook, Inc.*, 824 F.3d 1352, 1356–57 (Fed. Cir. 2016) ("We agree with Facebook that these terms have no plain or established meaning to one of ordinary skill in the art. As such, they ordinarily cannot be construed broader than the disclosure in the specification.").

The term "deposition line" appears several times in the Summary section of the '713 Patent, which states:

> An aspect of the present disclosure is directed to a method for printing a 3D part with an additive manufacturing system. The method includes printing layers of the 3D part and of a support structure for the 3D part from multiple print heads or *deposition lines* using a layer-based, additive manufacturing technique, and switching the print heads or *deposition line* between stand-by modes and operating modes in-between the printing of the layers of the 3D part and the support structure. The method also includes performing a purge operation for each print head or *deposition line* switched to the operating mode, where the purge operation includes printing a layer of at least one purge tower from the print head or *deposition line* switched to the operating mode.
>
> Another aspect of the present disclosure is directed to a method for printing a 3D part with an additive manufacturing system, which includes bringing a first print head or *deposition line* from a stand-by mode to an operating mode, printing a first layer of a purge tower from a support material using the first print head or *deposition line* in the operating mode, and printing a layer of a support structure from the support material using the first print head in the operating mode after printing the first layer of the purge tower. The method also includes bringing a second print head or *deposition line* from a stand-by mode to an operating mode, printing a second layer of the purge tower from a part material using the second print head or *deposition line* in the operating mode, and printing a layer of the 3D part from the part material using the second print head in the operating mode after printing the second layer of the purge tower.

'713 Patent at 1:57–2:20 (emphasis added). The Detailed Description section of the specification uses a parenthetical:

> When printing with *multiple print heads (or multiple deposition lines)*, each print head or deposition line is preferably switchable between an "operating mode" and a "stand-by mode".

'713 Patent at 4:1–4; *see id.* at 3:52–53 ("the additive manufacturing system may utilize multiple print heads or deposition lines").

Through these disclosures, the patentee demonstrated that a "deposition line" is different than a "print head" but performs a same or similar function in the disclosed methods and apparatuses. The patentee thereby used the term "deposition line" broadly, but, by virtue of reciting "deposition," the term does not refer to something like a guide tube that merely delivers material to a print head or other deposition tool. Although a "deposition line" could include (or be used in conjunction with) a tip or nozzle to facilitate depositing material (*see id.* at 1:30–39), a "deposition line" is itself configured for depositing material.

Finally, the parties dispute whether a "deposition line" must be distinct from a "guide tube" or could potentially include a "guide tube." Defendants argue that "a 'guide tube' cannot be a deposition line any more than it can be a print head." Dkt. No. 105 at 13 (citation omitted). Although, as discussed above, a "guide tube" is not sufficient to meet a "deposition line" limitation, there is no apparent restriction on whether a "guide tube" could be a component of a "deposition line."

The Court accordingly hereby construes these disputed terms as set forth in the following chart:

| Term | Construction |
|---|---|
| "deposition line" | **"a line that deposits material"** |
| "stand-by mode" | **"mode in which a print head or deposition line is not prepared to deposit material"** |

**10. "determining dimensions of the void region" and "determining the dimensions of the void region"**

| **"determining dimensions of the void region"** ('357 Patent, Claims 1, 8) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | "determining dimensions of the void region with at least one generated raster path" |
| **"determining the dimensions of the void region"** ('357 Patent, Claims 4, 12) | |
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | "determining the dimensions of the void region with at least one generated raster path" |

Dkt. No. 78, Ex. A at 10; *id.*, Ex. B at 12; Dkt. No. 126 at 5.

Shortly before the start of the December 9, 2025 hearing, the Court provided the parties with the following preliminary construction for these terms: "Plain Meaning."

(a) The Parties' Positions

Plaintiff argues that "Bambu concedes that the disputed phrases are readily understandable by including those same phrases in their proposed constructions," and "[i]nstead of construing the disputed phrases, Bambu injects additional limitations into the claims." Dkt. No. 93 at 17.

Defendants respond that "[t]he '357 Patent describes in detail a methodology of 'determining [the]/[] dimensions' of void regions with raster paths," and "[t]his is a critical aspect of the process." Dkt. No. 105 at 21. Defendants argue that "Plaintiff cannot identify a single embodiment that Bambu's construction would exclude, and instead merely points to boilerplate reservations." *Id.* (citation omitted).

Plaintiff replies that the specification directly refutes Defendants' argument that the dimensions must be determined with a raster path. Dkt. No. 119 at 5–6 (citing '357 Patent at 5:43–46).

At the December 9, 2025 hearing, the parties rested on their briefing without any oral arguments as to these terms.

(b) Analysis

Claims 1 and 3 of the '357 Patent recite (emphasis added):

> 1. A method of forming a three-dimensional object using an extrusion-based layered deposition system, the method comprising:
>
> generating a build path for building a layer of the three-dimensional object, wherein the build path defines a void region;
>
> generating at least one intermediate path in the void region;
>
> *determining dimensions of the void region based at least in part on the at least one generated intermediate path*; and
>
> generating a remnant path in the void region based at least in part on the at least one intermediate path, wherein the remnant path comprises deposition rates that are configured to vary based on the determined dimensions of the void region.
>
> * * *
>
> 3. The method of claim 1, *wherein the at least one intermediate path comprises a raster path*.

Because using a raster path is recited in a dependent claim, the doctrine of claim differentiation weighs against Defendants' proposal of requiring using a raster path. *Phillips*, 415 F.3d at 1315 ("the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim") (citation omitted). Defendants attempt to reconcile Claim 3 with their proposal by arguing that "Bambu's proposal does not require the 'intermediate path' to be a raster path; rather, the *dimensions* must be determined with a raster path, permitting the intermediate path to be a raster or non-raster path." Dkt. No. 105 at 21. Even accepting Defendants' statement as true, it does not undercut the

inference that Claim 3—by requiring determining dimensions of the void region based at least in part on a raster path—implies that Claim 1 does not require what Defendants are proposing, namely determining dimensions of the void region based on a raster path.

Defendants cite disclosure regarding Figure 4, which uses raster paths:

> FIG. 4 is a block diagram illustrating method 52, which is a suitable method for generating remnant path 21 in void region 20 pursuant to step 32 of method 22. As shown, method 52 includes steps 54-75, and initially involves generating raster path 50 based on the second road width resolution (step 54). The host computer then uses the raster legs of raster path 50 to determine void widths along void region 20. This involves calculating a raster leg length for a given raster leg of raster path 50 (starting with a first raster leg) (step 56), calculating a raster leg center point of the current raster leg (step 58), and calculating a void width of void region 20 at the raster leg center point (step 60).

*Id.* at 6:16–27; *see id.* at 7:12–9:3 (discussing calculating void widths). The use of raster paths, however, is a specific feature of particular disclosed embodiments that should not be imported into the claims. *See Phillips*, 415 F.3d at 1323.

Also, the specification discloses that a "raster path" is merely a type of "intermediate path":

> [T]he intermediate path is used to calculate a plurality of void widths along void region 20, and remnant path 21 is then generated based at least in part on the calculated void widths. This allows remnant path 21 to have a road width that varies with the dimensions of void region 20.
>
> * * *
>
> *Raster path 50 is an intermediate path* used to subsequently generate remnant path 21 pursuant to step 32 of method 22. Raster patterns are particularly suitable for identifying boundaries of theoretical roads (e.g., theoretical roads 44, 46, and 48). As such, *raster path 50 may be used to calculate the void widths of void region 20*, thereby allowing the host computer to generate remnant path 21 having a road width that varies with the dimensions of void region 20. *Alternatively, other types of intermediate paths may be used to calculate the dimensions of void region 20 and generate remnant path 21.*

'357 Patent at 4:30–33 & 5:36–46 (emphasis added); *see also id.* at 6:12 ("raster path 50 (or any alternative intermediate path)").

The Court therefore hereby construes "determining dimensions of the void region" and "determining the dimensions of the void region" to have their **plain meaning**.

**11. "void region"**

| **"void region"**<br>('357 Patent, Claims 1, 4, 7–10, 12, 14–16, 18) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | Indefinite |

Dkt. No. 78, Ex. A at 11; *id.*, Ex. B at 13; Dkt. No. 126 at 5.

Shortly before the start of the December 9, 2025 hearing, the Court provided the parties with the following preliminary construction: "Plain Meaning."

(a) The Parties' Positions

Plaintiff argues that "[t]he term 'void region' is readily understood by a POSITA both in view of the specification and for its use generally in the art." Dkt. No. 93 at 18 (footnote omitted).

Defendants respond that "[e]ven under Plaintiff's contention that '"void region" simply refers to the region or the area where a void exists' (Op. Br. at 18), the term is indefinite because a POSITA would not be able to determine the outer bounds of such a 'region' or 'area' with reasonable certainty." Dkt. No. 105 at 16. As to this term (as well as other terms for which Defendants assert indefiniteness), Defendants also submitted a notice of supplemental authority citing *Akamai Technologies, Inc. v. MediaPointe, Inc.*, No. 2024-1571, --- F.4th ----, 2025 WL 3274871 (Fed. Cir. Nov. 25, 2025), regarding indefiniteness based on lack of objective boundaries and based on the existence of multiple methods for determining whether a claim limitation is met. Dkt. No. 137.

Plaintiff replies that "[t]here is no dispute that a POSITA understands the term 'void,'" and "Defendants ask this Court to find the term 'region' inherently indefinite, but it is not." Dkt. No. 119 at 6 (citation omitted). Plaintiff urges that "[a] 'void region' is simply the region where a void exists within the build." *Id.*

At the December 9, 2025 hearing, the parties presented oral arguments as to this term. Defendants argued that it is impossible to make sense of these claims because the claims recite a "build path" that includes all paths. Plaintiff responded that Defendants' arguments demonstrate that Defendants themselves understand that a "void region" is an empty space that needs to be filled, and Plaintiff noted that Defendants' proposed construction for "determining dimensions of the void region" includes the term "void region." Plaintiff also submitted, however, that a void region could be left unfilled if desired. Further, Plaintiff argued that a "void region" is not limited to being filled with only remnant paths.

(b) Analysis

Claim 1 of the '357 Patent recites (emphasis added):

> 1. A method of forming a three-dimensional object using an extrusion-based layered deposition system, the method comprising:
>
> generating a build path for building a layer of the three-dimensional object, wherein the build path defines a *void region*;
>
> generating at least one intermediate path in the *void region*;
>
> determining dimensions of the *void region* based at least in part on the at least one generated intermediate path; and
>
> generating a remnant path in the *void region* based at least in part on the at least one intermediate path, wherein the remnant path comprises deposition rates that are configured to vary based on the determined dimensions of the *void region*.

The claim thus recites generating a remnant path that at least partially fills a "void region." The specification addresses this, such as in the following:

> Void region 20 is a location between perimeter paths 12, 14, and 16 that is too small to generate a perimeter path or a bulk raster path based on the first road width resolution. Moreover, the void width of void region 20 (taken along the y-axis)

> decreases generally along the x-axis when viewed from left-to-right in FIG. 1. If void region 20 is left unfilled, the resulting 3D object will contain a corresponding cavity disposed between the deposited roads of build material. As such, to correct this issue, the host computer generates remnant path 21 pursuant to the method of the present invention to fill void region 20.

'357 Patent at 3:35–45.

Defendants' expert likewise opines:

> The term "void" is used within the 3D printing space in a way that is consistent with its standard usage. For example, a void is typically understood as simply something that is empty, containing no matter, or not occupied. In this way, a POSITA would understand that a void in a 3D print build as [*sic*] an empty space with no fill. This is how the term was used around the time of the priority date for the '357 Patent and is still consistent with its usage today. In 3D printing, there can be voids in both a build path as well as the actual build. Additionally, voids can be intentional (e.g. hollow portions of an object), or they can be unintentional artifacts of the printing or design process.

Dkt. No. 93, Ex. Z, Sept. 10, 2025 Ganter Decl. ¶ 28.

Defendants' expert nonetheless opines that "when coupled with 'region' in the term 'void region,' the result is a term that was not known to have any specific meaning without context," and "[i]n the context of the patent, this term has multiple possible meanings including: (1) small unfilled regions where the dimension or area is smaller than a threshold, (2) large unfilled regions within a build path, or (3) any unfilled region of any size." *Id.* at ¶¶ 28 & 29.

This and related opinions by Defendants' expert are unpersuasive because Defendants' expert essentially merely reinforces that "void region" is a broad term. *See id.* at ¶¶ 28–51; *see, e.g., id.* at ¶ 40 ("the term void region could refer to virtually any type of empty region"); *id.* at ¶ 48 ("the distinction between large and small void regions is very important, and each poses different problems").

Defendants cite testimony of Plaintiff's expert as purportedly demonstrating confusion, such as Plaintiff's expert's distinction between "void" and "void region." Dkt. No. 105, Ex. 9,

Gall dep. at 42:3–6. This testimony, however, merely suggests that whereas "void" refers to empty space, "void region" includes also a notion of the spatial location of a particular empty space. *See id.* at 41:23–45:1.

Defendants also cite disclosure that "[t]he predefined dimensions for identifying bulk raster regions and void regions are desirably mutually exclusive," arguing that the word "desirably" creates confusion because it indicates that a "void region" could include some or all of a "raster region." *See* Dkt. No. 105 at 18. Defendants' expert has testified, however, that an area filed with bulk raster is not a "void region":

> Q. Is it your opinion that void regions refers to empty spaces within the object? [Objection]
> A. You and I have agreed that void regions must exist -- I don't know exactly how to define them -- must exist within the boundary of an object.
> BY [Counsel]:
> Q. And you and I have agreed that void regions refers to empty spaces generally, correct? [Objection]
> A. My understanding is we agreed that they were spaces not bulk raster filled.
> BY [Counsel]:
> Q. Empty spaces that are not bulk raster filled? [Objection]
> A. In my opinion, I'd say that's fair.
> BY [Counsel]:
> Q. So isn't it possible that void regions could mean empty spaces inside or within the 3D object? [Objection]
> A. I'd say that's reasonable.

Dkt. No. 93, Ex. V, Oct. 1, 2025 Ganter dep. at 224:15–225:17. On balance, the specification's usage of the word "desirably" does not give rise to any genuine confusion, let alone satisfy Defendants' burden to demonstrate indefiniteness by clear and convincing evidence. *See Sonix*, 844 F.3d at 1377.

Further, as to Defendants' argument that confusion arises because the "build path" includes any remnant paths, at first blush the specification appears to give rise to potential confusion because it discloses "remnant path 21" as being part of "build path 10." '357 Patent at 3:7–9. The

claims, however, do *not* recite a "remnant path" as being part of a "build path." *See id.*, Cl. 1 (reproduced above); *see also id.*, Cls. 4, 7–10, 12, 14–16 & 18 (similar in this regard).

The Court therefore hereby expressly rejects Defendants' indefiniteness argument, and Defendants present no alternative proposed construction. Finally, the parties' arguments during the December 9, 2025 hearing demonstrated a dispute regarding whether every "void region" must be filled. The claimed methods require a build path that defines a void region and require a remnant path in the void region, but nothing in these methods requires filling each and every void region that might be present in the three-dimensional object. With that understanding, no further construction is necessary.

The Court accordingly hereby construes "void region" to have its **plain meaning**.

**12. "intermediate path"**

| **"intermediate path"** ('357 Patent, Claims 1–3, 6, 10, 11, 16, 17) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | "a temporary path used to generate the build path but not used to deposit build material" |

Dkt. No. 78, Ex. A at 12; *id.*, Ex. B at 14; Dkt. No. 126 at 5.

Shortly before the start of the December 9, 2025 hearing, the Court provided the parties with the following preliminary construction: "a path used in determining dimensions as part of generating another path."

(a) The Parties' Positions

Plaintiff argues that "Bambu needlessly redefines the term 'intermediate path' to introduce unwarranted limitations into the claims, including by injecting a negative limitation found nowhere in the record and inserting language that conflicts with the surrounding claim terms." Dkt. No. 93

at 20. Plaintiff urges: "The '357 Patent never states that the intermediate path is 'temporary' or 'not used to deposit build material.' Indeed, these phrases appear *nowhere* in the intrinsic record." *Id.* Further, Plaintiff argues that Defendants' proposal "collapses distinct steps" because "[t]he claim first requires 'generating a build path' and then separately 'generating at least one intermediate path in the void region.'" *Id.* at 21.

Defendants respond: "Bambu's proposal is consistent with the intrinsic record, which shows that this path is used during internal processing to create the build path, but is not part of the build path used to extrude material. The path is *intermediate*—not final." Dkt. No. 105 at 19.

Plaintiff replies that "[t]here is no dispute that the build path and intermediate path are generated separately," and "Defendants simply fail to recognize that the intermediate path is generated in the void region that is defined by the build path." Dkt. No. 119 at 7 (citation omitted).

At the December 9, 2025 hearing, the parties rested on their briefing without any oral arguments as to this term (except that Plaintiff expressed agreement with the Court's preliminary construction).

(b) Analysis

Claim 1 of the '357 Patent, for example, recites (emphasis added):

> 1. A method of forming a three-dimensional object using an extrusion-based layered deposition system, the method comprising:
>
> generating a build path for building a layer of the three-dimensional object, wherein the build path defines a void region;
>
> generating at least one *intermediate path* in the void region;
>
> determining dimensions of the void region based at least in part on the at least one generated *intermediate path*; and
>
> generating a remnant path in the void region based at least in part on the at least one *intermediate path*, wherein the remnant path comprises deposition rates that are configured to vary based on the determined dimensions of the void region.

This claim thus recites generating paths and does not recite depositing material. The specification discloses:

> Build path 10 includes perimeter paths 12, 14, and 16, bulk raster region 17, bulk raster path 18, void region 20, and remnant path 21.
>
> * * *
>
> With regards to build path 10, the host computer identifies bulk raster region 17 as a bulk raster region within perimeter path 12, and also identifies void region 20 as a void region located between perimeter paths 12, 14, and 16.
>
> After the bulk raster regions and void regions are identified, the host computer may then generate bulk raster paths (e.g., bulk raster path 18) to fill the bulk raster regions (e.g., bulk raster region 17) (step 30). After the bulk raster paths are generated, the host computer may then generate a remnant path (e.g., remnant path 21) in an identified void region (step 32). Generation of remnant path 21 initially involves generating an intermediate path (not shown) within void region 20, and then generating remnant path 21 based on the intermediate path. As discussed below, the intermediate path is used to calculate a plurality of void widths along void region 20, and remnant path 21 is then generated based at least in part on the calculated void widths. This allows remnant path 21 to have a road width that varies with the dimensions of void region 20.

'357 Patent at 3:7–9 & 4:16–34.

At first blush, the specification appears to give rise to potential confusion because it discloses an "intermediate path" that is used to generate "remnant path 21," and "remnant path 21" is disclosed as being part of "build path 10." *Id.* The disclosed intermediate path is thus generated as part of generating a build path. These paths are interrelated in the specification because: (a) intermediate paths are within void regions 20 that were identified based on aspects of a build path 10; and (b) intermediate paths are used as part of generating remnant paths 21, and those remnant paths are incorporated into the build path 10. *See id.*

The claims, however, do not recite a "remnant path" as part of a "build path." Defendants' proposal that an "intermediate path" is "used to generate the build path" would therefore import a limitation from a particular embodiment, cause unnecessary confusion, or both.

As for Defendants' proposal that an "intermediate path" is "temporary" and is "not used to deposit build material," the claim language already expressly recites that the build path is "for

building a layer" and that the remnant path "comprises deposition rates." '357 Patent, Cl. 1; *see id.*, Cls. 2–3 (depending from Claim 1), 6 (same), 10 (depending from Claim 8, which is similar in this regard), 11 (depending from Claim 10), 16 (depending from Claim 15, which recites "generating a build path for building a layer" and "generating a remnant path in the void region for filling at least pan [*sic*, part] of a cavity corresponding to the defined void region") & 17 (depending from Claim 16). Coupled with the recitals of a remnant path that is generated at least in part based on the intermediate path, the claims already provide sufficient context for understanding the "intermediate path" in relation to the "build path" and the "remnant path."

The Court therefore hereby expressly rejects Defendants' proposed construction, and no further construction is necessary. *See U.S. Surgical*, 103 F.3d at 1568 ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy."); *see also O2 Micro*, 521 F.3d at 1362; *Finjan*, 626 F.3d at 1207; *ActiveVideo*, 694 F.3d at 1326; *Summit 6*, 802 F.3d at 1291; *Bayer*, 989 F.3d at 977–79.

The Court accordingly hereby construes "intermediate path" to mean **"a path used in determining dimensions as part of generating another path."**

**13. "road width resolution"**

| **"road width resolution"**<br>('357 Patent, Claims 2, 8, 9, 10, 15) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | Indefinite |

Dkt. No. 78, Ex. A at 12; *id.*, Ex. B at 14; Dkt. No. 126 at 5.

Shortly before the start of the December 9, 2025 hearing, the Court provided the parties with the following preliminary construction: "Plain Meaning."

(a) The Parties' Positions

Plaintiff argues that "[t]he term 'road width resolution' is readily understandable based on the intrinsic record," and "[i]n short, 'road width resolution' describes the fineness or sharpness with which the printer can print each deposited road—akin to how 'resolution' describes image clarity in other printing technologies." Dkt. No. 93 at 22.

Defendants respond that "[t]he term 'road width resolution' is used inconsistently and incompatibly throughout the specification and claims, preventing a POSITA from understanding it with reasonable certainty." Dkt. No. 105 at 22. Further, Defendants argue that "Plaintiff also conflates 'road width resolution' with the actual 'road width.'" *Id.*

Plaintiff replies that "Defendants point to discussion of a void region 'smaller than the first road width resolution' to argue that 'road width resolution' 'makes no sense," but "a POSITA would understand that a void region 'smaller than the first road width resolution' is one smaller than the spacing between roads set by the first road width resolution." Dkt. No. 119 at 7 (citation omitted).

At the December 9, 2025 hearing, the parties presented oral arguments as to this term. For example, Defendants argued that Claim 15 of the '357 Patent recites comparing an area to a road width resolution, which Defendants argued is mathematically impossible. Plaintiff responded that Claim 15 recites comparing a road width resolution to "dimensions," not to an area.

(b) Analysis

Claim 8 of the '357 Patent, for example, recites (emphasis added):

> 8. A method of forming a three-dimensional object using an extrusion-based layered deposition system, the method comprising:

> generating a build path for building a layer of the three-dimensional object, the build path being based on a first *road width resolution*;
>
> identifying a void region in the build path;
>
> determining dimensions of the void region; and
>
> generating a remnant path in the void region, wherein the remnant path comprises deposition rates that are configured to vary based on the determined dimensions of the void region.

The specification discloses:

> Based on these constant road widths, the host computer may generate the build path for depositing roads of build material based on a *"road width resolution"* that corresponds to the constant road widths. While relying on the given road width resolution, the host computer may properly offset each path so that the roads of build material are deposited adjacent each other without overlapping.
>
> * * *
>
> The first road width resolution corresponds to a standard road width of the deposited roads of build material used to build the 3D object. Examples of standard road widths for building the 3D object range from about 250 micrometers (about 10 mils) to about 1,020 micrometers (about 40 mils). The first road width resolution is desirably held constant to allow the road heights of the deposited roads to be constant, thereby providing a substantially uniform layer thickness.

'357 Patent at 1:50–57 & 3:17–24 (emphasis added). The specification also discusses the meaning of relatively "higher" road width resolution:

> Terms such as "higher road width resolution" and "a road width resolution that is higher" herein refer to a road width resolution that is finer and more detailed compared to another road width resolution. The higher road width resolution allows the host computer to generate raster paths in void regions that are smaller than the first road width resolution.

*Id.* at 5:50–56.

The parties agree that "road width" and "road width resolution" have different meanings. The above-reproduced disclosures discuss the relationship between these meanings, such as that "road width resolution" is a measure of spacing between roads and that a "higher" road width resolution generally corresponds to a smaller road width. The opinion of Plaintiff's expert is further persuasive in this regard. Dkt. No. 93, Ex. K, Gall Decl. at ¶ 49 ("Resolution was a well

known term for a POSITA at the time of the patents and is still used today to refer to the fineness of the road (or line) for 3D FDM printers and prints. Printers with higher road width resolution often print with smaller nozzles resulting in finer more closely packed print polymer print lines.").

Defendants do not persuasively demonstrate any irreconcilable contradiction or any other lack of reasonable certainty as to "road width resolution," including as to Defendants' citation of the disclosure that "void regions 20, 120, and 310 are generally discussed above as being smaller than the first road width resolution . . . ." '357 Patent at 17:48–51; *see id.* at 1:58–64 (referring to void regions that "are typically smaller than the constant road width resolution . . ."); *see also id.* at 4:11–14 (similar). In the claims, such as above-reproduced Claim 8 as well as Claim 15 (which the parties discussed during the December 9, 2025 hearing), the claims recite comparisons between road width resolution and "dimensions" of a void region. Defendants do not demonstrate any mathematical confusion (such as purportedly comparing an area to a length). Defendants present no alternative proposed construction, and no further construction is necessary.

The Court therefore hereby construes "road width resolution" to have its **plain meaning**.

**14. "a thermally conductive plate disposed adjacent to the build platform"**

| **"a thermally conductive plate disposed adjacent to the build platform"** ('660 Patent, Claim 1) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | Indefinite |

Dkt. No. 78, Ex. A at 13; *id.*, Ex. B at 15; Dkt. No. 126 at 5.

Shortly before the start of the December 9, 2025 hearing, the Court provided the parties with the following preliminary construction: "Indefinite."

(a) The Parties' Positions

Plaintiff argues: "[T]he claims themselves are clear. A POSITA would readily understand 'thermally conductive plate' to refer to a plate that transfers heat and spreads heat across its surface when used with the heated build platform of a 3D printer." Dkt. No. 93 at 23 (citation omitted).

Defendants respond that thermal conductivity is a property of *all* materials and that "Stratasys never identifies an objective boundary." Dkt. No. 105 at 23.

Plaintiff replies that "the claim language does not require any particular degree of thermal conductivity—it simply requires a 'thermally conductive plate.'" Dkt. No. 119 at 8.

At the December 9, 2025 hearing, the parties presented oral arguments as to this term. For example, Plaintiff argued that this limitation refers to any plate that conducts sufficient heat to prevent warping of the 3D object. In other words, Plaintiff argued that this term refers to any plate that accomplishes the thermal objective.

(b) Analysis

As a threshold matter, Plaintiff cites testimony of Defendants' expert in IPR proceedings that, for example, "a POSITA would have understood in plain language the term 'thermally conductive'" (*see* Dkt. No. 93 at 25 (citing *id.*, Ex. D, Aug. 21, 2025 Hickner dep. at 44:18–45:1); *see also id.* at 48:20–49:6 & 51:8–18.), but an IPR petition cannot assert indefiniteness. *See* 35 U.S.C. § 311(b); *see also Cuozzo Speed*, 136 S. Ct. at 2141–42; *Samsung*, 948 F.3d at 1355. Defendants' position in the IPR proceedings therefore does not significantly affect the Court's analysis. *See id.*; *see also* Dkt. No. 93, Ex. U, Sept. 30, 2025 Hickner dep. at 64:9–22 (". . . it's possible, like I did in my IPR declaration, to evaluate examples that meet the claim; but the outer bounds of thermally conductive are indefinite in my analysis").

Claim 1 of the ’660 Patent recites (emphasis added):

> 1. A build apparatus for printing a 3D object of thermoplastics employing additive manufacturing methods, the apparatus comprising:
>
> a build platform with a temperature control unit configured to control heating of the build platform;
>
> *a thermally conductive plate disposed adjacent to the build platform;* and
>
> a polymer coating attached to a surface of the thermally conductive plate which is capable of (i) facilitating adhesion to the 3D object during printing and (ii) permitting removal of the 3D object once the 3D object has been formed and cooled without chemically or mechanically removing the polymer coating from 3D object and without damaging the polymer coating, the thermally conductive plate, or the 3D object, wherein the polymer coating is not a polymer tape.

The specification discloses:

> The removable plate 104 must be *thermally conductive in nature*, so that it may be heated up due to the heat generated at the build platform 102 because of the temperature control means. Further, the removable plate 104 must be made of a material having a low coefficient of thermal expansion (CTE), to avoid expansion of the plate as it is heated up due to the heated build platform 102. In an embodiment, the material for the removable plate 104 *may be aluminum, steel, brass, ceramic, glass, or alloys similar with low coefficient of thermal expansion (CTE).* Also, the removable plate 104 must be thin, for example, the thickness of the plate 104 may range from 0.025–0.5". Further, the thickness of the plate 104 also depends on the flexural character of the material. The removable plate 104 must be thin enough to allow for minor flexing for part removal; however, it must not be too thin such that heating of the plate produces rippling, bowing, or warping of the plate, resulting in a print surface that is uneven or not consistently level. Furthermore, the removable plate 104 must be able to withstand high temperatures, such as and not limited to temperatures ranging up to 300 degrees Celsius.

’660 Patent at 3:57–4:10 (emphasis added); *see id.* at 1:49–50 (“Polyimide tape has been applied to heated build plates for its tactility and performance under high temperatures.”) & 5:43–46 (“the material of the plate 104 may be thin ceramic, which is thin enough to still conduct heat and have minimal expansion upon heating”).

The specification thus provides examples but does not provide any objective criteria for determining whether a particular material is “thermally conductive” for purposes of the claimed invention.

On one hand, Plaintiff cites authority that "a patentee need not define his invention with mathematical precision in order to comply with the definiteness requirement." *Niazi Licensing Corp. v. St. Jude Med. S.C., Inc.*, 30 F.4th 1339, 1347 (Fed. Cir. 2022) (citations omitted).

On the other hand, as Plaintiff's expert has acknowledged, the specification sets forth no objective boundary for "thermally conductive":

> Q. Does the patent provide an objective boundary for setting the degree of thermal conductivity required? [Objection]
> A. Not that I'm aware.

Dkt. No. 105, Ex. 9, Oct. 3, 2025 Gall dep. at 116:4–8; *see id.* at 115:15–20 (similar).

This is problematic because, as Plaintiff's expert acknowledges, thermal conductivity is a property of all materials. Dkt. No. 105, Ex. 9, Oct. 3, 2025 Gall dep. at 106:16–19. This property can have a value of any number ranging from low values (with zero thermal conductivity being expected in a perfect vacuum) to high values (such as for aluminum). *See* Dkt. No. 105, Ex. 9, Oct. 3, 2025 Gall dep. at 106:16–19 & 112:16–18.

But if any plate material could satisfy the claim limitation of "a thermally conductive plate disposed adjacent to the build platform," then the phrase "thermally conductive" would have no limiting effect, which would be disfavored. *Wasica Fin. GmbH v. Cont'l Auto. Sys., Inc.*, 853 F.3d 1272, 1288 n.10 (Fed. Cir. 2017) ("It is highly disfavored to construe terms in a way that renders them void, meaningless, or superfluous.") (citation omitted).

Assuming, then, that the phrase "thermally conductive" has some meaning as used in the claim, Defendants' expert's opinion is persuasive that "different POSITAs could look at the same plate and come to different conclusions about whether it is 'thermally conductive.'" Dkt. No. 93, Ex. H, Sept. 9, 2025 Hickner Decl. at ¶ 33. Plaintiff's reliance on the context provided by

surrounding claim language, namely that the disputed term is recited in the context of 3D printing, does not sufficiently provide any objective boundaries.

During the December 9, 2025 hearing, Plaintiff argued that this limitation refers to any plate that conducts sufficient heat to prevent warping of the 3D object. The claim, however, does not recite this objective or any other objective associated with the thermally conductive plate. Indeed, the claim provides no guidance at all regarding any required degree of thermal conductivity. The specification identifies examples of possible materials ('660 Patent at 3:57–4:10 (reproduced above)) but does not define or bound the term. In the absence of such guidance, "thermally conductive plate" is a term of degree with no objective boundaries. Likewise, this disputed term "depends on the unpredictable vagaries of any one person's opinion" without any objective anchors. *Interval Licensing*, 766 F.3d at 1371. This term is therefore indefinite. *Id.*

The Court accordingly hereby finds that "a thermally conductive plate disposed adjacent to the build platform" is **indefinite** (although the parties discussed dependent claims during the December 9, 2025 hearing, the Court does not address (and has not been asked to address) whether any of the dependent claims are indefinite).

**15. "without chemically or mechanically removing the polymer coating from the 3D object"**

| **"without chemically or mechanically removing the polymer coating from the 3D object"** ('660 Patent, Claim 1) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | Indefinite |

Dkt. No. 78, Ex. A at 14; *id.*, Ex. B at 15; Dkt. No. 126 at 5.

Shortly before the start of the December 9, 2025 hearing, the Court provided the parties with the following preliminary construction: "Plain Meaning."

(a) The Parties' Positions

Plaintiff argues that "the claims themselves provide an 'objective baseline' for interpretation," and "the polymer coating must not be removed chemically or mechanically from the 3D object because the coating must be capable of facilitating adhesion to the 3D object during printing but yet permit removal once the 3D object has formed and cooled." Dkt. No. 93 at 26 (citation omitted).

Defendants respond that "[t]his term is indefinite because the '660 Patent provides no objective boundaries for what constitutes 'chemical' or 'mechanical' removal, leaving POSITAs to guess which removal methods are prohibited by the claim." Dkt. No. 105 at 25 (citation omitted). For example, Defendants argue: "Without objective criteria, different POSITAs would draw different boundaries—one might say that using warm water constitutes chemical removal and another might not. One might consider any force applied to the object to be impermissible 'mechanical' removal; another might permit some small amount of force. These subjective determinations render the term indefinite." *Id.* at 26 (citation omitted).

Plaintiff replies that "[e]ven at his deposition *in this case*, [Defendants' expert] admitted that this term 'can be understood from the language given in the claim' rather than arguing indefiniteness." Dkt. No. 119 at 9 (citation omitted). Plaintiff argues that "chemically" and "mechanically" need not be expressly defined, and "[i]n any event, the specification itself provides ample guidance, offering examples of both chemical/mechanical and non-chemical/non-mechanical removal." *Id.* (citations omitted).

At the December 9, 2025 hearing, the parties presented oral arguments as to this term. Defendants argued, for example, that neither the claim nor the specification provide any guidance on how force can be applied while still being "without . . . mechanically removing." Plaintiff

responded that this term is reasonably clear because "chemically" requires a chemical reaction and "mechanically" requires using a tool.

(b) Analysis

As a threshold matter, Plaintiff cites opinions of Defendants' expert in an IPR proceeding (Dkt. No. 93, Ex. D, Aug. 21, 2025 Hickner dep. at 51:8–18 & 66:4–67:20), but an IPR petition cannot assert indefiniteness. *See* 35 U.S.C. § 311(b); *see also Cuozzo Speed*, 136 S. Ct. at 2141–42; *Samsung*, 948 F.3d at 1355. Defendants' position in the IPR proceedings therefore does not significantly affect the Court's analysis. *See id.*

Claim 1 of the '660 Patent recites (emphasis added):

> 1. A build apparatus for printing a 3D object of thermoplastics employing additive manufacturing methods, the apparatus comprising:
>
> a build platform with a temperature control unit configured to control heating of the build platform;
>
> a thermally conductive plate disposed adjacent to the build platform; and
>
> a polymer coating attached to a surface of the thermally conductive plate which is capable of (i) facilitating adhesion to the 3D object during printing and (ii) permitting removal of the 3D object once the 3D object has been formed and cooled *without chemically or mechanically removing the polymer coating from* [*the*] *3D object* and without damaging the polymer coating, the thermally conductive plate, or the 3D object, wherein the polymer coating is not a polymer tape.

The Background section of the specification discusses a problem of potential damage to a 3D printed part:

> Even if a part is built on an area of polyimide tape without debris or air bubbles, the tape can be easily damaged upon removal of the part. At elevated temperatures, the bottom layer of tape can permanently adhere to the 3D part causing the tape to tear or bubbles to form between the tape and build plate. Even when the part has been fully cooled, the polyimide tape can still adhere to the bottom layer resulting in damage or tearing of the tape upon part removal.
>
> Another problem with the current structures of the build platform is that a user has to wait for the build platform to cool to reduce the risk of damage to the part during removal[,] and even when plate is cooled, the part may be difficult to remove without damaging the part and/or the polyimide tape.

'660 Patent at 1:57–2:2. The specification further discloses:

> The removable plate 104 must be *thin enough to allow for minor flexing for part removal*; however, it must not be too thin such that heating of the plate produces rippling, bowing, or warping of the plate, resulting in a print surface that is uneven or not consistently level.
>
> * * *
>
> The removable plate 104 also possesses flexibility owing to the type of material it is made of. The flexibility of the plate 104 allows for easier dissociation between the 3D object and the removable plate 104 upon cooling. Further, this flexibility also reduces the possibility of damage to the high temperature polymer coating 106 or the 3D object during object removal since *a blade or wedge is no longer needed to pry off the object.*
>
> The advantage of having the removable plate 104 secured over the build platform 102 is easy removal of the built object upon completion. This happens, since the removable plate 104 is thin and also there is a significant difference in thermal contraction between the removable plate and the 3D printed polymer object. Therefore once the building of the object is finished, *the object will pop off the plate 104 when the plate and part have cooled.* This efficiently avoids the general issue in the current art, where the 3D object sticks to the heated build platform, and the object has to be *dug out* from the platform in order to remove it or having to remove the object from a support raft requiring an additional step to *dissolve or mechanically remove the support* from the part.
>
> * * *
>
> The flexibility of the removable plate 104 also reduces the possibility of damage to the coating 106 or the object during object removal since *a blade or wedge is no longer needed to pry off the part.*

*Id.* at 4:3–7, 5:6–25 & 6:23–25 (emphasis added).

The above-reproduced disclosures in the specification provide sufficient context for a person of ordinary skill in the art to understand the scope of this disputed claim language with reasonable clarity. *See Interval Licensing*, 766 F.3d at 1370 ("absolute or mathematical precision is not required").

As for "chemically" removing, Defendants argue that this is unclear because "one might say that using warm water constitutes chemical removal and another might not." Dkt. No. 105 at 26. On its face, "without chemically . . . removing" refers to the absence of any chemical reaction. Defendants' hypotheticals regarding "using warm water" (*id.*) or adjusting humidity (discussed at the December 9, 2025 hearing) are not plausible concerns when faced with the claim language reciting "without chemically . . . removing."

As for "mechanically" removing, Defendants argue that the disclosures regarding avoiding prying, scraping, or digging are insufficient because: "Removal may involve intermediate methods: tapping the object, pulling gently, using fingernails, and applying moderate force. Even just lifting the 3D object from the plate involves mechanical force. The patent provides no framework for which of these constitute[] impermissible 'mechanical' removal." Dkt. No. 105 at 26.

In the context of the above-reproduced disclosures, the recital of "without . . . mechanically removing" refers to removal without applying mechanical force to the polymer coating other than by manipulating (and thereby applying force to) the 3D object that is being removed. This does not preclude holding the plate in place when force is applied to the 3D object, but the intrinsic evidence demonstrates that "without . . . mechanically removing" precludes any "pry[ing]" by inserting a tool between the 3D object and the polymer coating. '660 Patent at 5:6–25 & 6:23–25.

Finally, as to both "mechanically" and "chemically," Defendants' own expert has testified in the present case that these limitations "can be understood from the language given in the claim":

> Q. Dr. Hickner, what does facilitating adhesion do to a 3D object during printing?
> [Objection]
> A. Oh, you're talking in small bullet point 1 in claim 1?
> BY [Counsel]:
> Q. Yes.

> A. So facilitating adhesion to the 3D object during printing is just what it says. It can be understood by the words in the claim.
> Q. And what is "without chemically or mechanically removing the polymer coating from the 3D object"? [Objection]
> A. That's in small bullet point 2 in claim 1. *Without chemically or mechanically removing the polymer coating from 3D object, that can be understood from the language given in the claim.*

Dkt. No. 93, Ex. U, Sept. 30, 2025 dep. at 73:23–74:20 (emphasis added); *see id.* at 52:12–59:18.

The Court accordingly hereby construes "without chemically or mechanically removing the polymer coating from the 3D object" to mean **"without using a chemical reaction to remove the polymer coating from the 3D object, and without applying mechanical force to the polymer coating other than through the 3D object."**

**16. "without damaging the polymer coating"**

| **"without damaging the polymer coating"** ('660 Patent, Claim 1) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | Indefinite |

Dkt. No. 78, Ex. A at 15; *id.*, Ex. B at 16; Dkt. No. 126 at 6.

Shortly before the start of the December 9, 2025 hearing, the Court provided the parties with the following preliminary construction: "Plain Meaning."

(a) The Parties' Positions

Plaintiff argues that this term "would have been readily understood to mean removing the printed object without impairing the polymer coating's function." Dkt. No. 93 at 27. Plaintiff notes that the specification discloses "examples of damage, such as air gaps creating an uneven surface, coatings that burn off with heat, coatings that adhere to the 3D part causing tearing or bubbles, and coatings that easily scratch or puncture." *Id.* at 28 (citation omitted).

Defendants respond: "This stark lack of test methods, measurement protocols, or thresholds of acceptable imperfections leaves a POSITA wondering whether issues such as microscopic wear, discoloration, surface roughening, and minor adhesion loss fall within the bounds of this claim. While the specification lists various problems (air gaps creating uneven surfaces, adhesive burning off, coatings tearing or bubbling, surfaces that scratch or puncture), it provides no objective standard distinguishing 'damaged' from functional." Dkt. No. 105 at 27 (citations omitted). Defendants submit that "[o]ne POSITA might consider any visible imperfection 'damage,' and another might require complete functional failure." *Id.*

Plaintiff replies that "Bambu's own expert, Dr. Hickner, has testified in this case that this term is readily understandable from the words in the claim." Dkt. No. 119 at 9 (citation omitted).

At the December 9, 2025 hearing, the parties presented oral arguments as to this term.

(b) Analysis

As a threshold matter, Plaintiff cites Defendants' arguments in an IPR proceeding, but an IPR petition cannot assert indefiniteness. *See* 35 U.S.C. § 311(b); *see also Cuozzo Speed*, 136 S. Ct. at 2141–42; *Samsung*, 948 F.3d at 1355. Defendants' position in the IPR proceedings therefore does not significantly affect the Court's analysis. *See id.*

Claim 1 of the '660 Patent recites (emphasis added):

> 1. A build apparatus for printing a 3D object of thermoplastics employing additive manufacturing methods, the apparatus comprising:
>
> a build platform with a temperature control unit configured to control heating of the build platform;
>
> a thermally conductive plate disposed adjacent to the build platform; and
>
> a polymer coating attached to a surface of the thermally conductive plate which is capable of (i) facilitating adhesion to the 3D object during printing and (ii) permitting removal of the 3D object once the 3D object has been formed and cooled without chemically or mechanically removing the polymer coating from [the] 3D object and *without damaging the polymer coating*, the thermally conductive plate, or the 3D object, wherein the polymer coating is not a polymer tape.

The parties have also discussed dependent Claim 12 of the '660 Patent, which adds a requirement that the thermally conductive plate is "flexible":

> 12. The build apparatus of claim 1, wherein the thermally conductive plate is *flexible* so as to allow for easier dissociation between the 3D object and the thermally conductive plate upon cooling and *reduce damage to the polymer coating or the 3D object during removal of the 3D object.*

Defendants argue that Claim 12 gives rise to a contradiction because whereas dependent Claim 12 recites "reduc[ing]" damage, independent Claim 1 recites "without damaging." *See TVnGO Ltd. (BVI) v. LG Elecs. Inc.*, No. 2020-1837, 861 F. App'x 453, 459–460 (Fed. Cir. June 28, 2021). If anything, however, this is perhaps a potential internal inconsistency in dependent Claim 12; the term here in dispute is in independent Claim 1, not dependent Claim 12.

To whatever extent *TVnGO* is applicable, *TVnGO* is distinguishable because the court there noted that the dependent claims were "one of the few sources of intrinsic evidence on the meaning of [the disputed term] in this record." *Id.* at 460. In the present case, the Background section of the specification, for example, discloses that although polyimide tape can be beneficially used on build plates, such tape is susceptible to damage when a 3D printed part is removed:

> Polyimide tape has been applied to heated build plates for its tactility and performance under high temperatures. Applying polyimide tape is a difficult process inevitably allowing for tiny debris or air to be trapped between the tape and metal surface. Once the metal surface is heated, the air gaps expand creating an uneven printing surface. Further, the adhesive for the polyimide tape can burn off under high temperatures releasing fumes and damaging the coating.
>
> Even if a part is built on an area of polyimide tape without debris or air bubbles, the tape can be easily damaged upon removal of the part. At elevated temperatures, the bottom layer of tape can permanently adhere to the 3D part causing the tape to tear or bubbles to form between the tape and build plate. Even when the part has been fully cooled, the polyimide tape can still adhere to the bottom layer resulting in damage or tearing of the tape upon part removal.

'660 Patent at 1:49–64. Also, the Detailed Description of the Embodiments section of the specification discloses using a polymer coating such as a polyimide coating:

> Advantageously, embodiments of the present invention provides an apparatus comprising a heated build platform 102 over which a removable plate 104 is removably secured, and a layer of a high temperature polymer coating 106 is applied over the surface of the plate 104. The high temperature polymer coating 106 provides adhesion between the 3D object and the surface of the plate 104. Further, embodiments of the present invention disclose surface treatment of the high temperature polymer coating 106 in order to increase polymer adhesion and the plate 106. Therefore, the use of a high temperature polymer coating 106 in an embodiment of the present invention instead of polyimide tape over a removable plate provides a consistent, smooth, tacky, long-lasting surface for the construction of 3D objects via FFF and continuous fiber deposition. Further, a method of securing the coated removable plate 104 to a fixed build platform 102 to allow for easy separation of the object from the removable plate 104 and for quick exchange of objects between builds.
>
> Furthermore, the polyimide coating 106 has demonstrated better adherence properties both to the bottom layer of a 3D object and the plate 104 over the currently used polyimide tape. This coating 106 is much more resilient compared to polyimide tape, which can be easily scratched or punctured. The surface toughness of this coating 106 *prevents damage from occurring during 3D object removal.* The polyimide coating 106 does not wear away and thus does not need to be replaced. On the other hand, the current art polyimide tape is preferably replaced after every build under high temperature build platform temperatures. Also, the polyimide coating 106 is applied to a clean plate minimizing or eliminating the potential for trapped debris or air bubbles between the coating 106 and removable plate surfaces 104.

*Id.* at 5:52–6:18 (emphasis added); *see id.* at 4:48–54 ("[T]he high temperature polymer coating 106 is resilient in nature and cannot be easily scratched or punctured. The surface toughness of this coating 106 prevents damage from occurring during 3D object removal. Furthermore, the high temperature polymer coating 106 does not wear away and thus does not need to be replaced after every build under high temperature."); *see also id.* at 5:9–12 ("flexibility also reduces the possibility of damage to the high temperature polymer coating 106 or the 3D object during object removal since a blade or wedge is no longer needed to pry off the object"); *id.* at 6:10–12 ("The polyimide coating 106 does not wear away and thus does not need to be replaced.").

Defendants argue that there is a "stark lack of test methods, measurement protocols, or thresholds of acceptable imperfections" (Dkt. No. 105 at 27), but the above-reproduced disclosures, especially the disclosure of providing a "long-lasting surface for the construction of 3D objects," are sufficient context for understanding with reasonable certainty the recital of "without damaging the polymer coating." *See Interval Licensing*, 766 F.3d at 1370 ("absolute or mathematical precision is not required").

Also, Defendants' own expert has testified in the present case that this limitation "can be understood from the language in the claim":

> Q. Dr. Hickner, what does facilitating adhesion do to a 3D object during printing? [Objection]
> A. Oh, you're talking in small bullet point 1 in claim 1?
> BY [Counsel]:
> Q. Yes.
> A. So facilitating adhesion to the 3D object during printing is just what it says. It can be understood by the words in the claim.
> Q. And what is "without chemically or mechanically removing the polymer coating from the 3D object"? [Objection]
> A. That's in small bullet point 2 in claim 1. Without chemically or mechanically removing the polymer coating from 3D object, that can be understood from the language given in the claim.
> BY [Counsel]:
> *Q. What is "without damaging the polymer coating"?* [Objection]
> *A. That is words in the claim that can be understood from the language in the claim.*

Dkt. No. 93, Ex. U, Sept. 30, 2025 dep. at 73:23–75:3 (emphasis added).

The Court therefore hereby expressly rejects Defendants' indefiniteness argument. Defendants present no alternative proposed construction, and no further construction is necessary.

The Court accordingly hereby construes "without damaging the polymer coating" to have its **plain meaning**.

**17. "properties from the target printer that affect the fabrication capabilities of the target printer"**

| **"properties from the target printer that affect the fabrication capabilities of the target printer"** ('774 Patent, Claim 1) | |
|---|---|
| **Plaintiff's Proposed Construction** | **Defendants' Proposed Construction** |
| Plain and ordinary meaning | Indefinite |

Dkt. No. 78, Ex. A at 16; *id.*, Ex. B at 16; Dkt. No. 126 at 6.

Shortly before the start of the December 9, 2025 hearing, the Court provided the parties with the following preliminary construction: "Plain Meaning."

(a) The Parties' Positions

Plaintiff argues that "the term uses plain English words to describe 3D printer properties that affect fabrication, which a POSITA would readily understand," and "Claim 1 explains that these properties are used to create a fabrication profile." Dkt. No. 93 at 29 (citation omitted). Plaintiff also argues that "the specification provides guidance and examples describing how printer capabilities relate to fabrication." *Id.* (citation omitted).

Defendants respond that "neither the claims nor the specification give any hint on how to determine which properties 'affect' the fabrication capabilities of the target printer." Dkt. No. 105 at 28 (citation omitted); *see id.* at 28–29.

Plaintiff replies: "Bambu demands an 'exhaustive list' of all properties that affect fabrication, but the law imposes no such requirement. Nor does Bambu explain why the examples in the '774 Patent fail to provide 'any guidance' to a POSITA." Dkt. No. 119 at 10.

At the December 9, 2025 hearing, the parties presented oral arguments as to this term.

(b) Analysis

As a threshold matter, Plaintiff notes that Defendants applied prior art to the plain meaning of this term in IPR proceedings, but an IPR petition cannot assert indefiniteness. *See* 35 U.S.C. § 311(b); *see also Cuozzo Speed*, 136 S. Ct. at 2141–42; *Samsung*, 948 F.3d at 1355. Defendants' position in the IPR proceedings therefore does not significantly affect the Court's analysis.

Also, Plaintiff cites the prosecution history as demonstrating that the patent examiner understood this term, but this does not affect the Court's analysis because this is already taken into account as part of the presumption of validity. *See* 35 U.S.C. § 282.

Turning to the claim language, Claim 1 of the '774 Patent recites (emphasis added):

> 1. A method comprising:
> receiving a request to fabricate an object from a three-dimensional model;
> determining a target printer to fabricate the object;
> querying the target printer for configuration information of the target printer relevant to creation of a printable model for fabrication of the object on the target printer;
> receiving, from the target printer, a dictionary of configuration information containing *one or more properties from the target printer that affect fabrication capabilities of the target printer*;
> creating a fabrication profile based on the one or more properties; and generating a machine-ready representation of the three-dimensional model
> executable by the target printer to fabricate the object.

The Summary section of the specification states:

> The hardware and software properties of a three-dimensional printer can be queried and applied to select suitable directly printable models for the printer, or to identify situations where a new machine-ready model must be generated. The properties may be any *properties relevant to fabrication* including, e.g., physical properties of the printer, printer firmware, user settings, hardware configurations, and so forth. A printer may respond to configuration queries with a dictionary of capabilities or properties, and this dictionary may be used to select suitable models, or determine when a new model must be created. Similarly, when a printable model is sent to the printer, metadata for the printable model may be compared to printer properties in the dictionary to ensure that the model can be fabricated by the printer.

'774 Patent at 1:39–52 (emphasis added). The specification further discloses:

> There are numerous makes and models of printers, each of which may have different physical capabilities such as build volume, extruder types, minimum step sizes, top speeds, operating temperature ranges, and so forth. Similarly, there may be user configurations, user preferences and the like that are defined in software, as well as hardware accessories such as cameras, three-dimensional scanners, heated build platforms, conveyors, and so forth. Additionally, these printer configurations may change over time, either resulting from manufacturer updates to improve printer performance or user modifications for convenience, specialty applications, and so forth. Against this backdrop, the methods and systems described herein provide useful techniques for determining printer capabilities and matching these capabilities to pre-existing machine-ready models.
>
> * * *
>
> The properties may include one or more of information, capabilities, features, functions, configurations, data, and the like *relevant to fabrication* of the object. It will be understood that throughout this disclosure the terms 'property' and 'configuration' (and variations thereof) may be used interchangeably, and thus, unless explicitly stated otherwise or clear from the context, a property may include a configuration and vice-versa. The properties may include a hardware configuration of the target printer, a software configuration, a user setting or preference, or a firmware configuration of the target printer.
>
> * * *
>
> As discussed above, the properties may also or instead include printing capabilities of the target printer. The printing capabilities may include without limitation color capabilities (e.g., one color, multi-color, color mixing, color changing, and the like), size capabilities (e.g., overall size or minimum feature size), speed capabilities, resolution and accuracy capabilities, build material capabilities, and so forth.

'774 Patent at 17:39–53, 19:15–25 & 20:55–62 (emphasis added).

The specification thus demonstrates that the disputed term encompasses any properties relevant to fabrication, and, as Plaintiff argues, the meaning is broad but "breadth is not indefiniteness." *BASF Corp. v. Johnson Matthey Inc.*, 875 F.3d 1360, 1367 (Fed. Cir. 2017). The opinions of Defendants' expert, particularly that a person of ordinary skill in the art "would not know the bounds of the subset consisting of 'properties from the target printer that affect fabrication capabilities of the target printer,'" are therefore unpersuasive. Dkt. No. 93, Ex. M, Sept. 9, 2025 Hickner Decl. ¶ 29. Defendants note that Plaintiff's expert has testified as to not

knowing whether "affects fabrication" and "relevant to fabrication" are synonymous or not, but Defendants do not persuasively demonstrate that this gives rise to indefiniteness. Dkt. No. 105, Ex. 9, Oct. 3, 2025 Gall dep. at 35:4–7. Also, the testimony of Plaintiff's expert demonstrates that a person of ordinary skill in the art would understand that some properties of a printer would not affect fabrication, such as the color of the structural components of the printer. *Id.* at 37:3–12. Finally, Defendants' expert testified regarding various properties that affect fabrication. Dkt. No. 93, Ex. U, Sept. 30, 2025 Hickner dep. at 273:8–284:3.

The Court therefore hereby expressly rejects Defendants' indefiniteness argument. Defendants present no alternative proposed construction, and no further construction is necessary.

The Court accordingly hereby construes "properties from the target printer that affect the fabrication capabilities of the target printer" to have its **plain meaning**.

## V. CONCLUSION

The Court adopts the constructions set forth in this opinion for the disputed terms of the patent-in-suit. The parties are ordered that they may not refer, directly or indirectly, to each other's claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the Court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

**SIGNED this 18th day of February, 2026.**

ROY S. PAYNE
UNITED STATES MAGISTRATE JUDGE

**APPENDIX A**

| Term | Agreed Construction |
|---|---|
| "a machine vision system configured to capture and analyze image content"<br>('097 Patent, Claims 1, 9–12, 14–18) | Plain and ordinary meaning |

Dkt. No. 105 at 10.