John P. Schnurer, Bar No. 185725
JSchnurer@perkinscoie.com
Joseph P. Reid, Bar No. 211082
JReid@perkinscoie.com
Michael J Engle, Bar No. 259476
MEngle@perkinscoie.com
Kimberly I. Kennedy, Bar No. 253828
KimberlyKennedy@perkinscoie.com
Perkins Coie LLP
11988 El Camino Real, Suite 350
San Diego, CA 92130-2594
Telephone: 858.720.5700
Facsimile: 858.720.5799

Attorneys for Plaintiff and Counterclaim Defendant Largan Precision Co., Ltd.

UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF CALIFORNIA

LARGAN PRECISION CO., LTD.,

Plaintiff,

v.

SAMSUNG ELECTRONICS CO., LTD.; SAMSUNG ELECTRONICS AMERICA, INC.; and SAMSUNG TELECOMMUNICATIONS AMERICA, LLC,

Defendants.

SAMSUNG ELECTRONICS CO., LTD.; SAMSUNG ELECTRONICS AMERICA, INC.; and SAMSUNG TELECOMMUNICATIONS AMERICA, LLC,

Counterclaim Plaintiffs,

v.

LARGAN PRECISION CO., LTD.,

Counterclaim Defendant.

Case No. 13-CV-2740 DMS (NLS)

PLAINTIFF LARGAN PRECISION CO., LTD.'S OPENING CLAIM CONSTRUCTION BRIEF

JURY TRIAL DEMANDED

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I. INTRODUCTION

In its May 5, 2014 Case Management Conference Order, the Court expressly limited the parties to a maximum of ten "most significant" disputed claim terms for *Markman*. And, in large part, that limitation has paid off. Plaintiff Largan has identified just two terms that require construction: one that may be dispositive on the entire '925 Patent (an obvious typographical error wherein the absolute value symbol in a formula was replaced by a "□"), the other potentially dispositive as to claim 21 of the '190 Patent (another obvious typographical error omitting the minus sign before a negative number).[1] Similarly, Samsung has identified one claim term that could be dispositive as to all but one claim of the '807 Patent ("at least one inflection point formed on the object-side and image-side surfaces").

Unfortunately, this is where the relative simplicity of the implicated technology begins to lead to unintended consequences. Apparently not content to have only three terms construed, Samsung has identified another term for construction—"plastic"—that not only has a plain and ordinary meaning understandable to almost everyone, but which has no apparent effect on any infringement or validity argument in the case. In addition, contrary to the Court's Patent Local Rules, on the day the Joint Claim Construction Statement was due, Samsung for the very first time attempted to introduce nine (9) distinct claim preambles into the *Markman* process which Samsung suddenly contended were limiting in some unidentified way.[2]

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[1] At the May 5, 2014 conference, Largan was asserting eight patents against Samsung. On August 29, 2014, consistent with the claim and prior art reductions the parties proposed as a case management mechanism, Largan reduced its asserted claims from 112 to 40, eliminating two patents in the process. Accordingly, the remaining patents-in-suit are U.S. Patent Nos. 7,262,925 ("the '925 Patent"); 7,394,602 ("the '602 Patent"); 8,154,807 ("the '807 Patent"); 8,508,860 ("the '860 Patent"); 8,670,190 ("the '190 Patent"); and 8,670,191 ("the '191 Patent") (collectively "the Patents-in-Suit"), attached as Exhibits 1–6 to the Declaration of Kimberly Kennedy, filed concurrently herewith. Unless otherwise noted, all exhibits referenced herein are attached to the Kennedy Declaration.

[2] The parties also appeared to have a dispute over additional terms Samsung claimed were indefinite. Largan maintained such terms should be raised as part of

For the reasons set forth herein, Federal Circuit precedent clearly allows this Court to correct the two sets of typographical errors identified by Largan as part of claim construction. Similarly, an examination of the intrinsic record shows that the term selected by Samsung, "at least one inflection point formed on the object-side and image-side surfaces," has a definite meaning to one of ordinary skill in the art. With respect to the remaining terms, however, Largan respectfully requests that the Court refuse to construe them due to their lack of controversy and late identification. Alternatively, if the Court decides it must construe them, Largan requests it follow Federal Circuit precedent by giving "plastic" its plain and ordinary meaning and by finding that the preambles are not limiting.

II. BACKGROUND OF THE TECHNOLOGY

The Patents-in-Suit all relate to what is known as an "imaging lens." An imaging lens is the type of lens used in digital cameras, such as the camera of a typical smartphone. Each imaging lens actually consists of multiple individual lenses, each of which is referred to as a "lens element." While imaging lenses may contain any number of lens elements, in general the more lens elements a particular imaging lens has, the better quality image it can generate. Not surprisingly, however, the more lens elements a particular imaging lens has, the more expensive that lens element is to produce in terms of design, raw materials, size, and manufacturing cost.

When it comes to the kind of mobile phones with which the Court is likely familiar, the front-mounted cameras—typically used for lower-resolution applications like videoconferencing, Skype, and FaceTime—currently use lenses with three or four lens elements. The rear-mounted cameras, used for higher quality still pictures and video, currently use lenses containing four, five, or six lens

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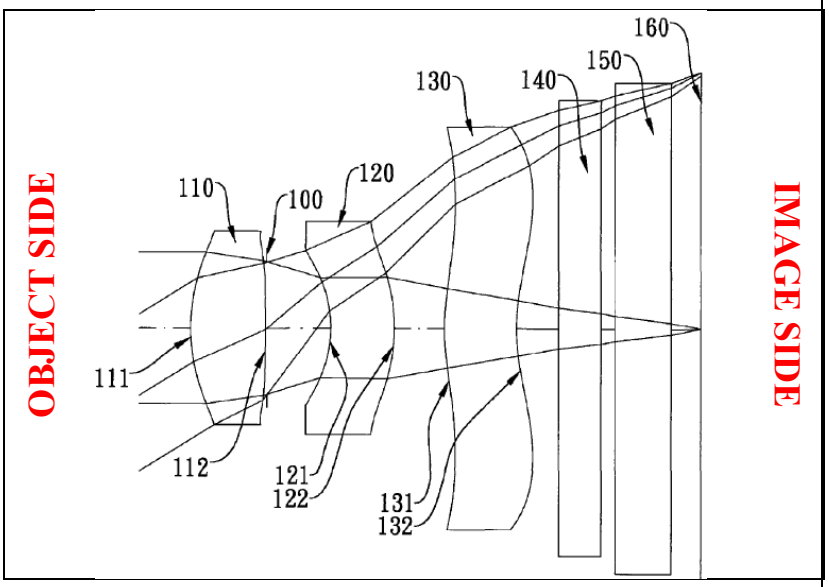
claim construction, while Samsung disagreed. Ultimately, however, Largan currently understands Samsung has agreed not to raise any additional indefiniteness arguments because any remaining terms Samsung intended to challenge on definiteness grounds were removed by the claim reductions on August 29, 2014.

elements. Not surprisingly, then, the Patents-in-Suit are directed to imaging lenses containing either three lens elements (the '925 Patent, '602 Patent, and '807 Patent) or five lens elements (the '860 Patent, '190 Patent, and '191 Patent).[3] Figure 1 from the '807 Patent, reproduced below, shows a schematic view of a three lens element system.



While Figure 1 may look complex at first blush, it is important to recognize that the concepts and principles of optics remain the same whether one is talking about these kinds of lens elements or the larger lenses most people are familiar with from their everyday lives, such as a magnifying glass, eyeglasses, or the large glass lenses used in traditional cameras. If one thinks of the series of lens elements in Figure 1 as individual eyeglasses arranged in a line, the figure and descriptions of what is happening at each lens element may be easier to understand.

Each lens element has two surfaces: the surface closest to the object being photographed (called the "object-side surface") and the surface closest to the sensor capturing the image (called the "image-side surface"). By convention, the object side is presented on the left, while the image side is on the right. In Figure 1 of the '807 Patent, for example, the object-side surface of lens element 120 (the second lens element) is labeled 121, and the image-side surface is labeled 122.

The individual lens elements (labeled 110, 120, and 130 in Figure 1 above)

[3] *E.g.*, '925 Patent at Abstract, FIG. 1; '602 Patent at Abstract, FIG. 1; '807 Patent at Abstract, FIG. 1; '860 Patent at Abstract, FIG. 1A; '190 Patent at Abstract, FIG. 1; '191 Patent at Abstract, FIG. 1.

are arranged and numbered such that the first lens element (on the left) is always closest to the object being photographed while the final lens element is closest to the image plane (labeled number 160 in the figure above), where a sensor captures the image.[4] Frequently, a sheet of flat glass or plastic (called an "infrared cut filter," "IR cut filter," or "IR filter," and labeled number 140 in the figure above) is placed between the last lens element and the image plane (labeled 160) to block infrared light while allowing visible light to pass through it.[5]

Each surface of a lens element can have its own unique shape. However, as one can see in Figure 1 above, when viewed in cross-section, the top half of each lens element is identical to its bottom half. This is because each lens element is symmetrical around a line extending through the very center of the lens, called the "optical axis." In Figure 1 above, the optical axis is represented by the dotted line drawn from left to right through the center of each lens element.

The shape of a surface may change significantly over the course of the entire surface. When describing the curves in these lenses, those in the industry often use the very same adjectives as those familiar with the lenses used in eyeglasses: generally, curving outward (away from the center of a lens element) is "convex," while curving inward (toward the center of a lens element) is "concave." Again using the second lens element 120 from Figure 1 of the '807 Patent above as an example, the object-side surface (labeled 121) generally curves inward, *i.e.*, is concave, while the image-side surface (labeled 122) generally curves outward, *i.e.*, is convex. In contrast, switching to the third lens element in Figure 1 (labeled 130) as an example, the image-side surface (labeled 132) is concave at the center of the lens element yet becomes convex when looking above or below the center. These different shapes bend light in different ways. In Figure 1 above, the solid lines going through the imaging lens represent rays of light. Figure 1 depicts how those

[4] *E.g.*, '807 Patent at 9:37–39, FIG. 1.
[5] *E.g.*, '807 Patent at 8:33–37, FIG. 1.

rays of light are bent by this particular imaging lens and ultimately focused at a point on the image plane (labeled 160).

As products such as mobile phones have shrunk and their users have required higher performance cameras, the demand for small, high quality imaging lenses has skyrocketed. Today, imaging lenses are only a few millimeters thick: the imaging lens shown in Figure 1 above measures less than 4 millimeters at the optical axis, slightly thicker than a stack of two quarters and smaller in diameter than a pea.[6] Despite their small size, these imaging lenses allow everyday users of a thin smartphone to take astonishingly good pictures that just a few years ago would have required a bulky and expensive professional camera.

Because of their extremely small size, precision in the design and manufacture of an imaging lens is very important. As such, imaging lenses are defined and constructed according to extremely precise mathematical values. Even small changes to just one of these mathematical values can prevent the entire lens from working. The Patents-in-Suit provide these values in tables such as Tables 1 and 2 from the '807 Patent, reproduced below:

TABLE 1

(Embodiment 1)

f (= 2.94 mm, Fno = 2.85, HFOV = 30.9 deg.

Surface #		Curvature Radius	Thickness	Material	Index	Abbe #	Focal length
0	Object	Plano	Infinity				
1	Lens 1	1.19531 (ASP)	0.529	Plastic	1.544	55.9	2.17
2		-100.00000 (ASP)	0.011				
3	Ape. Stop	Plano	0.455				
4	Lens 2	-0.81723 (ASP)	0.452	Plastic	1.632	23.4	-7.81
5		-1.18917 (ASP)	0.357				
6	Lens 3	1.56295 (ASP)	0.512	Plastic	1.544	55.9	41.54
7		1.29311 (ASP)	0.300				
8	IR-filter	Plano	0.300	Glass	1.517	64.2	-
9		Plano	0.100				
10	Cover-glass	Plano	0.400	Glass	1.517	64.2	-
11		Plano	0.207				
12	Image	Plano	-				

TABLE 2

Aspheric Coefficients

Surface #	1	2	4
k =	-1.70385E+00	-1.00000E+00	-1.31512E+00
A4 =	7.67879E-02	-1.56097E-01	-2.35158E-01
A6 =	-4.58698E-02	-4.79651E-01	-6.29168E-01
A8 =	-3.26052E-01	1.67180E+00	8.87475E+00
A10=	1.36337E-01	-1.02020E+01	-2.83446E+01
A12=	-1.02715E+00	2.04499E+01	2.70740E+01
Surface #	5	6	7
k =	-6.46829E-01	-9.35664E+00	-5.30143E+00
A4 =	-6.31957E-02	-2.86962E-01	-2.50554E-01
A6 =	2.34261E-01	2.29278E-01	1.61519E-01
A8 =	1.46455E+00	-8.68173E-02	-9.28945E-02
A10=	-1.95730E+00	9.14338E-03	3.09188E-02
A12=	7.10910E-01	1.27783E-03	-4.87656E-03

[6] *See* '807 Patent at Table 1 (summing the "thickness" of each item).

Tables such as these are conventional and commonplace in the lens industry. For example, Defendants' own patents use tables nearly identical to those above.[7]

Patent	Asserted Claims	Priority Date
7,262,925	1, 2, 4, 7, 8	Oct. 18, 2005
7,394,602	5, 6, 11, 12	Oct. 30, 2006
8,154,807	1, 2, 3, 4, 6, 7, 9, 10, 20, 22	Mar. 9, 2010
8,508,860	7	Oct. 6, 2010
8,670,190	1, 2, 4, 5, 7, 8, 11, 26, 28, 33	July 14, 2009
8,670,191	1, 5, 6, 8, 12, 18, 20, 21, 30, 33	July 14, 2009

Using these drawings and tables, the Patents-in-Suit claim specific lens properties, such as surface shapes, powers, and mathematical formulae, that allow today's lens designers to achieve the compact size and high performance demanded by consumers.[8] A summary of the asserted claims and priority dates of each patent is provided in the table above.

III. LEGAL STANDARDS FOR CLAIM CONSTRUCTION

A. The Purpose of Claim Construction

The claims of a patent define the scope of the invention. *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1324 (Fed. Cir. 2002). They provide the "metes and bounds" of the patentee's right to exclude. *Kara Tech. Inc. v. Stamps.com Inc.*, 582 F.3d 1341, 1347 (Fed. Cir. 2009). The purpose of claim construction is to resolve the meaning and technical scope of claim terms. *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004). Accordingly, claim construction "must begin and remain centered on the claim language itself." *Id.* at 1116. Claim construction is a matter of law. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 372 (1996).

B. Terms Should Be Given Their Plain and Ordinary Meaning

Claim terms are normally given their "ordinary and customary meaning." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005). Generally, "the ordinary and customary meaning of a claim term is the meaning that the term would

[7] *E.g.*, Ex. 7, U.S. Patent No. 8,665,533 at Tables 1, 3; Ex. 8, U.S. Patent No. 8,767,314 at Tables 1–2; Ex. 9, U.S. Patent App. Pub. No. 2014/0152887 at Table 2.

[8] *E.g.*, '807 Patent at 1:43–46, 2:36–39, Claim 1.

have to a person of ordinary skill in the art in question at the time of the invention." *Id* at 1313. "It is axiomatic that we will not narrow a claim term beyond its plain and ordinary meaning unless there is support for the limitation in the words of the claim, the specification, or the prosecution history." *3M Innovative Properties Co. v. Tredegar Corp.*, 725 F.3d 1315, 1333 (Fed. Cir. 2013).

C. The Best Guide Is the Intrinsic Evidence

To determine the proper meaning of a disputed term, the best guide is a patent's intrinsic evidence, which consists of the patent's specification (including the claims) and prosecution history. *Teleflex*, 299 F.3d at 1325. Construction begins with the language of the claim, and the court should "presume that the terms in the claim mean what they say." *Power Integrations, Inc. v. Fairchild Semicon. Int'l, Inc.*, 711 F.3d 1348, 1360 (Fed. Cir. 2013) (citing *Phillips*, 415 F.3d at 1312 ("the claims are of primary importance, in the effort to ascertain precisely what it is that is patented")). In addition, "the context in which a term is used in the asserted claim can be highly instructive." *Phillips*, 415 F.3d at 1314. For example, "[d]ifferences among claims can . . . be a useful guide in understanding the meaning of particular claim terms." *Id.*

In addition to the claims, the specification's written description is an important consideration during the claim construction process. "[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)). Care must be taken, however, to avoid unnecessarily reading limitations from the specification into the claims. *Teleflex*, 299 F.3d at 1326; *Raytheon Co. v. Roper Corp.*, 724 F.2d 951, 957 (Fed. Cir. 1983) ("That claims are interpreted in light of the specification does not mean that everything expressed in the specification must be read into all the claims."). "[P]articular embodiments appearing in the written description will not be used to limit claim

language that has broader effect." *Innova/Pure Water*, 381 F.3d at 1117; *Phillips*, 415 F.3d at 1323 ("although the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments").

The prosecution history is also part of the intrinsic evidence. *Phillips*, 415 F.3d at 1317. It "consists of the complete record of the proceedings before the PTO and includes the prior art cited during the examination of the patent." *Id.*

D. Extrinsic Evidence Cannot Contradict the Intrinsic Evidence

If the intrinsic record is ambiguous, the court may rely on extrinsic evidence—*i.e.*, everything external to the patent and prosecution history, such as expert and inventor testimony, dictionaries, and learned treatises—to aid with understanding the meaning of claim terms. *Power Integrations*, 711 F.3d at 1360. Extrinsic evidence, however, is generally less useful or reliable than intrinsic evidence. *Phillips*, 415 F.3d at 1317. Most importantly, extrinsic evidence "may never be used" to vary or contradict the intrinsic evidence. *Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1332 (Fed. Cir. 2001).

E. A District Court Can and Should Correct Obvious, Typographical Errors

When it comes to errors in claims, the courts distinguish between obvious typographical errors and material errors. Courts have been correcting errors in the former category since at least 1926, following the Supreme Court's decision in *I.T.S. Rubber Co. v. Essex Rubber Co.*, 272 U.S. 429 (1926). The patent in that case related to "resilient heels" or, in plain language, a rubber sole that attaches to the bottom of a shoe. *Id.* at 434. The disputed claim in that case omitted the word "rear" when describing the "upper edge" of the rubber sole. *Id.* at 435. The district court corrected the claim language and the Supreme Court affirmed, stating that the omission was due to a "clerical error . . . and that both the counsel for the applicant and the examiner understood that [the term] was contained [in the disputed claim]."

Id. at 442. The Court further stated that the correction is not "a re-making of the claim; but is merely giving to it the meaning which was intended by the applicant and understood by the examiner." *Id.*

Consistent with *I.T.S. Rubber*, the Federal Circuit has held that a district court should correct errors through claim construction when: "(1) the correction is not subject to reasonable debate based upon consideration of the claim language and the specification and (2) the prosecution history does not suggest a different interpretation of claims." *CBT Flint Partners, LLC v. Return Path, Inc.*, 654 F.3d 1353, 1358 (Fed. Cir. 2011) (overturning a district court's failure to correct the claim language "detect analyze" to "detect and analyze"). Both determinations must be made from the point of view of one skilled in the art. *Ultimax Cement Mfg. Corp. v. CTS Cement Mfg. Corp.*, 587 F.3d 1339, 1353 (Fed. Cir. 2009). Following this rule, the Federal Circuit has regularly determined that corrections to claim language were appropriate. *E.g.*, *id.* (overturning a district court's decision that a claim was indefinite due to the omission of a comma in a chemical formula because one with ordinary skill in the art would know that the formula should contain a comma); *Forest Labs., Inc. v. Ivax Pharm., Inc.*, 501 F.3d 1263 (Fed. Cir. 2007) (affirming correction of an optical rotation sign from positive to negative); *Hoffer v. Microsoft Corp.*, 405 F.3d 1326 (Fed. Cir. 2005) (overturning determination of indefiniteness and correcting a claim's reference to a claim number that was rendered obsolete by re-numbering during prosecution).

The Federal Circuit has also addressed non-obvious or material errors that do not meet this criteria. In *Group One*, the Federal Circuit affirmed the district court's finding that a 24-word clause that was mistakenly omitted by the PTO could not be inserted by the Court during claim construction. *Group One, Ltd. v. Hallmark Cards, Inc.*, 407 F.3d 1297, 1303 (Fed. Cir. 2005). As the Federal Circuit explained, missing an entire 24-word clause was not the type of error that could be corrected because it was not obvious from the face of the patent—the claim

language made sense without the missing clause and, in order to uncover the mistake, one would have to read the prosecution history. *Id.* Similarly, in *Novo*, the claim language ("stop means formed on a rotatable with said support finger") contained an error, but it was not clear from the face of the patent or from the prosecution history how the error should be corrected. *Novo Indus., L.P. v. Micro Molds Corp.*, 350 F.3d 1348, 1352–53 (Fed. Cir. 2003). Each of the proposed corrections required adding or deleting different words, and the prosecution history provided no meaningful clarification. *Id.* at 1357–58. The court held that the claim was indefinite because it was not possible to know "what correction is necessarily appropriate or how the claim should be interpreted." *Id.* at 1358.

Consistent with the Federal Circuit, this Court has made corrections to claims in appropriate cases. *E.g.*, *DR Sys., Inc. v. Fujifilm Med. Sys. USA, Inc.*, No. 06–CV–417, 2007 WL 4259164, at *2–3 (S.D. Cal. Dec. 3, 2007) (correcting the placement of "yes" and "no" arrows in a block diagram referenced in a claim because the error was clear on the face of the patent and the intrinsic record made clear how the mistake should be corrected); *Pulse Eng'g, Inc. v. Mascon, Inc.*, No. 08cv0595, 2009 WL 755321, at *9–10 (S.D. Cal. Mar. 9, 2009) (correcting (1) "output" to "input" and (2) "first" to "third" based upon the specification).

IV. DISPUTED TERMS

A. The Symbol "□" Is An Obvious Misprint of the Absolute Value Sign "|" and Should Be Corrected By the Court

Term	Asserted Claims	Largan's Construction	Samsung's Construction
"□"	'925 Patent: 1	The Court should construe the printing error of a box "□" as an absolute value symbol "|".	Indefinite

Largan and Samsung agree that the "□" inserted into claim 1 of the '925 Patent—and, by extension, the remainder of the '925 Patent's claims, which all depend from claim 1—renders the claim superficially unintelligible. The difference between the parties is, where Samsung stops there and contends the entire '925

Patent is indefinite, Largan looks back to the intrinsic record, as the Federal Circuit instructs, to see what the "□"means.

The intrinsic record quickly resolves this "mystery" regarding the "□": wherever the formulae from claim 1 of the '925 Patent are presented in the specification or file history, the "□" is consistently replaced by the mathematical symbol "|" denoting an absolute value, such as in the formula "| f / f1 |".[9] For example, the first misprinted formula (□L1R1/L1R2□<0.5) appears in its correct form (|L1R1/L1R2|<0.5) in the specification at least four times. *See* '925 Patent at Abstract, 2:2, 2:56; 3:58. The '925 Patent also describes embodiments that comply with the proper formula, such as |L1R1/L1R2|=0.104 in Table 1 and |L1R1/L1R2|=0.149 in Table 2. The same is true of the second formula: □L3R1/L3R2□>0.3[10] appears correctly as |L3R1/L3R2|>0.3 at least four times. *See id.* at Abstract, 2:4, 3:3, 3:62. And just as with the first formula, the embodiments described in the tables meet the proper formula, such as |L3R1/L3R2|=0.543 and |L3R1/L3R2|=0.466. Each of the remaining formulae also are described correctly at least once in the specification. *See id.* at 4:15–18; *see also* Tables 1 and 2 (describing embodiments that are compliant with the proper formulae).

The prosecution history is completely consistent with the specification. When the application that resulted in the '925 Patent was originally filed, its claims contained formulae properly printed with the absolute value signs. Ex. 10, '925 Patent Prosecution History ("'925 PH"), Application at LAR-SAM0000056–57 (Oct. 18, 2005). For example, original claim 1 contained two of the formulae (|L1R1/L1R2|<0.5 and |L3R1/L3R2|>0.3), and original claim 2 (a dependent of original claim 1) contained the remaining three formulae (1.5>|f/fl|>1.0;

[9] The result of taking an absolute value in mathematical terms is to eliminate the possibility of negative numbers. Thus, the absolute value of 2 and −2 is exactly the same, *i.e.*, 2. Written as an equation, | 2 | = | −2 | = 2.

[10] The formula appears in the claim as □R3R1/L3R2□>0.3. However, the parties agree that "R3R1" as printed in the claims should be construed as "L3R1." D.I. 40-2 at 28; D.I. 40-1 at 1 n.2.

1.2>|f/f2|>0.7; and 1.2>|f/f3|>0.3). *Id.*

The PTO Examiner clearly understood the mathematical meaning of the absolute value symbols, as he did not issue an indefiniteness rejection. *See* '925 PH, Office Action at LAR-SAM0000067–75 (Feb. 20, 2007). Instead, the first office action merely noted that original claim 2 "would be allowable if rewritten in independent form," *i.e.*, if the limitations of original claim 1 and original claim 2 were combined into a single independent claim. *Id.* at LAR-SAM0000068–69.

The applicant's subsequent amendment followed the Examiner's instructions, amending claim 1 to include all of the additional limitations of claim 2. '925 PH, Amendment at LAR-SAM0000076–83 (May 14, 2007). But, as the Court can see, this is where the typographical error was introduced. *Compare* '925 PH, Application at LAR-SAM0000056–57 (Oct. 18, 2005), *with* '925 PH, Amendment at LAR-SAM0000079–81 (May 14, 2007). Because the PTO Examiner allowed the '925 application without any further changes, the typographical error was carried forward into the issued version of the patent. *See* '925 PH, Notice of Allowance at LAR-SAM0000085–87 (June 7, 2007).

Given that the "□" was introduced in an applicant's amendment, it bears asking whether the applicant intended to replace the absolute value symbol with this other character. The file history itself indicates that the replacement was inadvertent. To begin, PTO regulations require that any text being added to a claim in an amendment must be underlined while any text deleted is shown either in strikethrough or in [brackets]. 37 C.F.R. § 1.121(b)(1)(ii). Here, the applicant underlined the additional limitation language imported from claim 2 exactly as one would expect, but the boxes replaced the absolute value signs even in the portions of the claim without any underlining or strikethrough. '925 PH at LAR-SAM0000079–81 (May 14, 2007 Amendment). For example, "|L1R1/L1R2|" and "|L3R1/L3R2|" have their absolute value signs replaced by boxes despite not

having any underlining, strikethroughs, or brackets. This demonstrates the applicant did not intend to change any of them.

Claim 6 confirms the typographical error was unintentionally introduced. Specifically, PTO regulations require the applicant in an amendment to specify whether each claim is in its "original" form, or whether it is "currently amended" in a parenthetical following the claim number. 37 C.F.R. § 1.121(c). In this amendment, claim 6 is still listed as "original," *i.e.*, unchanged from the application, as opposed to claim 1's "currently amended." *Id.* at LAR-SAM0000081. Nevertheless, the typographical error "1.15<□d/h□<2.5" has replaced the absolute value signs in claim 6 with boxes, just as in claim 1. *Id.* If replacing the absolute value with boxes were an intentional change, claim 6 would have been listed as "currently amended," and shown the deleted absolute value signs in [brackets] or strikethrough, while underlining the added boxes. The fact the applicant listed claim 6 as being unchanged demonstrates the applicant did not intend to make any change to the absolute value signs.

This inadvertent character swap is exactly the kind of "clerical error" the Court is empowered to fix under *I.T.S. Rubber*. The proposed correction here—returning "□" to the intended absolute value sign "|"—is not subject to reasonable debate: the inserted "□" has no mathematical meaning, rendering the formulae in the claims meaningless and inoperative as written. And, as shown above, the prosecution history does not suggest a different interpretation of the claims; indeed, the prosecution history confirms the correction Largan proposes. *See CBT Flint Partners, LLC v. Return Path, Inc.*, 654 F.3d 1353, 1358 (Fed. Cir. 2011).

A particularly applicable case is the Federal Circuit's decision in *Ultimax Cement Mfg. Corp. v. CTS Cement Mfg. Corp.*, 587 F.3d 1339 (Fed. Cir. 2009). There, the claim mistakenly omitted a comma between the "f" and "cl" in the formula $C_9S_3S_3Ca(f\ cl)_2$. Despite realizing that one of ordinary skill would have noticed the comma's absence, the district court determined the missing comma

rendered the claim indefinite. The Federal Circuit reversed because "the claimed formula $C_9S_3S_3Ca(f\ cl)_2$ corresponds to no known mineral, and . . . one of ordinary skill in the art would know that the formula should contain a comma." *Id.* at 1353 (quotation omitted). Here, as in *Ultimax*, the typographical error in claim 1 of the '925 Patent would be obvious to a person of ordinary skill:[11] the "□" symbols are meaningless in the context of the patent, while absolute value bars "|" are meaningful and used throughout the formulae in the specification and file history.

In contrast to Largan, Samsung takes the extreme position that the symbol "□"renders claim 1 of the '925 Patent—and, by extension, every other claim of the patent—indefinite. This would yield a remarkable result: if Samsung were correct, the Examiner allowed not just one indefinite claim, but rather an entirely indefinite patent. To reach such a conclusion, however, Samsung makes two missteps.

First, as noted above, Samsung violates the primary tenet of claim construction and ignores the intrinsic evidence. Anyone reading the specification and file history can see how this error occurred, and one of ordinary skill in the art would recognize the only possible solution is to fix the transcription error.[12]

Second, Samsung has no choice but to rely on the *Group One* set of cases that deal with *substantive* errors rather than the *I.T.S. Rubber* line of decisions. In the parties' Joint Claim Construction Chart (D.I. 40-1 at 4–5), Samsung cites two cases that relate to mistakes requiring material or non-obvious corrections. As discussed above, in *Group One*, the correction sought was a 24-word clause that was not obviously missing on the face of the patent. In *Novo*, there were multiple

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[11] The *Ultimax* example is even more extreme than the situation here, as there is no suggestion in the Federal Circuit's opinion that the comma was ***ever*** present in the application or file history. Here, in contrast, the intrinsic record is clear that the absolute value bars were present at the start of prosecution.

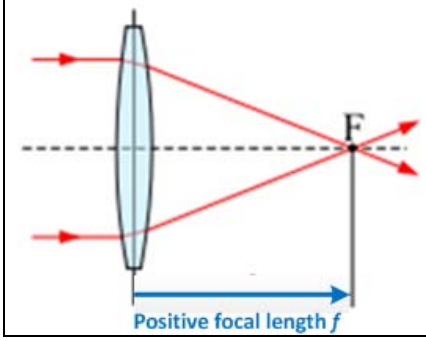
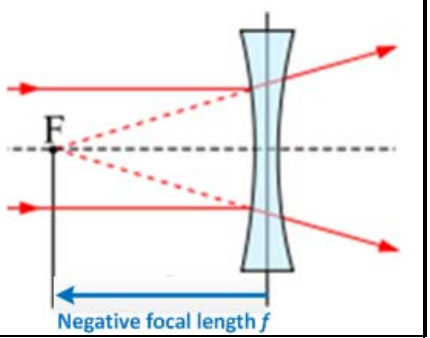
[12] Samsung's feigned ignorance regarding the use of absolute values in the '925 patent's formulas is further undercut by the fact that Samsung's own patents use absolute value signs for nearly identical terms describing imaging lenses. *E.g.*, Ex. 11, U.S. Patent No. 7,889,441 at claims 1–3; Ex. 8, U.S. Patent No. 8,767,314 at claim 3; Ex. 9, U.S. Patent App. Pub. No. 2014/0152887 at claims 2–3.

potential ways the claim could be corrected, leaving the court unsure which to apply. Here, no such problems exist. There is only ***one*** solution to the transcription error and that one solution is immediately obvious from both the specification and the prosecution history: swapping the box for the absolute value bar. Samsung cannot point to any substantive confusion or reasons the "□" is unsolvable. Accordingly, the Court should correct the typographical error and replace each of the mistakenly inserted "□" with an absolute value bar, "|".

B. The Obvious Misprint in the Formula "−1.5<f4/f5≤0.79" Should Be Corrected

Term	Asserted Claims	Largan's Construction	Samsung's Construction
"−1.5<f4/f5≤0.79"	'190 Patent: 21	"−1.5<f4/f5≤−0.79"	Plain and ordinary meaning

The '190 Patent also contains an obvious transcription error, but only a single one that impacts a single claim. Specifically, a negative sign was eliminated during printing, changing the value of a number in a formula from "−0.79" to "0.79". Like the "□" discussed above, the intrinsic evidence demonstrates this was nothing but a simple printing error, well within this Court's powers to correct.

Positive Focal Length	Negative Focal Length
	

The Court will recall from the discussion of technology above that, by industry convention, lens elements are presented with the object side on the left and the image sensor on the right. "Focal length" is an inherent property of each lens element, referring in general terms to the point along the optical axis where light rays passing through the lens element converge and come into focus.

Lens elements of different shapes can have focal lengths that fall to the left of the lens or to the right of the lens element. For example, here are the focal lengths of two, differently-shaped lens elements, shown in isolation.

To distinguish between these scenarios, industry convention dictates that distances along the optical axis to the ***right*** of a lens are referred to in ***positive*** numbers, while distances along the optical axis to the *left* of the lens are measured as ***negative***. Accordingly, in the pictures above, the focal length of the lens on the left is positive, while the focal length on the right is negative.

In the '190 Patent, the formula specifies a ratio of focal lengths of the fourth and fifth lens elements, where the focal length of the fourth lens element is referred to as "f4," and the focal length of the fifth lens element is referred to as "f5."

Throughout the '190 Patent's specification, f4 is a positive number and f5 is a negative number. '190 Patent at 4:21–23, 6:4–6, 7: 61–64, 9:26–29, 10:60–63, Tables 1, 3, 5. Simple math dictates that when you place a positive number over a negative number, the result is a negative number. The result ***cannot*** be positive. Not surprisingly, then, the proper formula in the '190 Patent states that the ratio of these two values (*i.e.*, f4/f5) must be between "−1.5" and "−0.79," not "0.79."

This is also demonstrable by reference to the refractive power. Refractive power is the reciprocal of focal length, *i.e.*, the number one divided by the focal length.[13] That means refractive power and focal length have the same sign (*i.e.*, positive or negative). In the '190 Patent, the claim in question (claim 21) expressly *requires* that the fourth lens element have "positive refractive power." Thus, it also has positive focal length. Conversely, claim 21 expressly requires that the fifth lens element have "negative refractive power." Thus, it has negative focal length. Again, this means if you take the ratio of these values you will be dividing a

[13] *E.g.*, *Kallal v. Ciba Vision Corp.*, No. 09 C 3346, 2013 WL 328985, at n.1 (N.D. Ill. Jan. 28, 2013) ("refractive power . . . is the reciprocal of the focal length").

positive number by a negative number. The result ***must*** be negative. A person of ordinary skill in the art seeing these refractive power requirements knows that having f4/f5 be a positive 0.79 was a mathematical impossibility.

The '190 Patent's specification is completely consistent with this mathematical certainty. Figure 13 expressly lists the f4/f5 ratio as being −0.79, a negative number. Similarly, the text of the '190 specification describes in text that "[i]n the first embodiment of the present imaging lens system, the focal length of the fourth lens element 130 is f4, the focal length of the fifth lens element 140 is f5, and they satisfy the relation: f4/f5=−0.79." '190 Patent at 7:61–64. The '190 specification also makes clear that the f4/f5 ratio falls within a preferred range between −1.5 and −0.5. As is to be expected, −0.79 falls squarely in this range.

As with the mis-transcription of the "□" above, a review of the '190 Patent's prosecution history demonstrates where this error was inadvertently introduced. Original claim 23, which issued as claim 21, was added in an amendment dated October 21, 2013. Ex. 12, '190 Patent Prosecution History ("'190 PH") at LAR-SAM0001444. In the October 21 amendment, the formula is claimed in its correct form, *i.e.*, $-1.5<f4/f5\leq-0.79$, while in the Remarks section, the applicant explains that "[t]he upper limit of the feature $-1.5<f4/f5\leq-0.79$ is supported by the first embodiment of the present specification as originally filed, and hence no new matter issue is raised." *Id.* at LAR-SAM0001448. The applicant additionally distinguished the formula from a piece of prior art based upon the f4/f5 ratio being $-1.5<f4/f5\leq-0.79$.[14] *Id.* Further, the applicant explained the effect of having a ratio that satisfies the formula $-1.5<f4/f5\leq-0.79$, specifically that it "ensures the telephoto structure formed by the fourth and fifth lens elements and facilitates reducing the total track length of the system," which was not taught by the prior art.

[14] The prior art taught f4/f5 values of −0.44, −0.38, and −0.45, so Samsung's interpretation of this limitation as ranging from −1.5 to positive 0.79 is a subtle attempt to reintroduce prior art that the applicant already expressly distinguished. *Id.* at LAR-SAM0001448–49.

Id. at LAR-SAM0001449. Thus, it is clear from the prosecution history that the upper limit was intended to be −0.79 for a legitimate and performance-related reason. Claim 21 was allowed following the amendment. '190 PH, Notice of Allowability at LAR-SAM000001453–56 (Dec. 11, 2013). The error appears to have arisen from the PTO (not the applicant) inadvertently printing the issued patent without the negative sign in claim 21.

In addition to the case law discussed above, the Federal Circuit has dealt with this very issue, determining that the correction of a similar sign error was appropriate, in *Forest Laboratories, Inc. v. Ivax Pharmaceuticals, Inc.*, 501 F.3d 1263 (Fed. Cir. 2007). In that case, the optical rotation sign of a chemical component in a pharmaceutical product was changed from (+)-diol intermediate to (−)-diol intermediate during reissue. In a later infringement case, the defendant asserted that the reissue improperly broadened the claim due to the change in sign. The district court disagreed and the Federal Circuit affirmed. As the Federal Circuit explained, the change of sign was merely a typographical error that would have been readily apparent to one having ordinary skill in the art based on the disclosures in the specification and could be corrected. *Id.* at 1271. Although this case arises in a slightly different context—during claim construction rather than after reissue—the principle is the same. Because the error would have been obvious to one having ordinary skill in the art based on the disclosures in the specification, the correction is appropriate and the Court should revert 0.79 to −0.79, exactly as the specification, prosecution history, applicant, and examiner intended.

C. "at least one inflection point formed on the object-side and image-side surfaces"

Term	Asserted Claims	Largan's Construction	Samsung's Construction
"at least one inflection point formed on the	'807 Patent: 2, 20	This term is not indefinite and should be given its plain and ordinary meaning, which is "at	Indefinite

Term	Asserted Claims	Largan's Construction	Samsung's Construction
object-side and image-side surfaces"		least one inflection point formed on at least one of the object-side and image-side surfaces".	

This term should be given its plain and ordinary meaning. Samsung's only possible indefiniteness argument[15] requires twisting the word "and" to mean that there must be two inflection points, one on each of the object and image side surfaces. But that reading is quickly dispatched by both the claim language itself and the '807 specification.

To begin, the claim does not say "at least ***two*** inflection points" nor does it say "an inflection point on ***both*** the object-side and image-side surfaces." Indeed, if we unpack the disputed claim language, there are two requirements. The first portion of the phrase "at least one inflection point" means exactly what it says—there must be at least ***one*** inflection point. The second portion, "formed on at least one of the object-side and image-side surfaces" says that that inflection point must be on "at least one of" two specified surfaces—in other words, the inflection point can be formed on either the object-side or image-side surface, and optionally, both.

This is exactly in line with the specification which repeatedly describes "at least one inflection point is formed on ***one of*** the both surfaces." *E.g.*, '807 Patent at 2:18–19, 6:2–3, 7:13–14 (emphasis added); *see also* 3:11–12 ("the third lens element is provided with ***at least one*** inflection point") (emphasis added), 4:63–64 (same). Thus, to a person of ordinary skill reading the specification—indeed even to a layperson—there is no ambiguity. Exactly as the specification says, the claim requires only an inflection point on "***one of*** the both surfaces." *See Phillips*, 415

[15] Samsung has not yet articulated its basis for asserting this term is indefinite. Its argument in the Joint Claim Construction chart provides only the generic assertion that "[t]his term, viewed in light of the specification and prosecution history, fail to inform those skilled in the art about the scope of the invention with reasonable certainty."

F.3d at 1315 ("[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.") (quotation omitted).

Further emphasizing that the inflection point need only be on one side, four out of the six embodiments have a second lens element with an inflection point only on one side, not both. *See* '807 Patent at FIGs. 1, 3, 9, 11 (all having a second lens element with an inflection point on the image side but not the object side). To the extent Samsung attempts to argue the inflection point must be on both surfaces, that would read out the majority of the preferred embodiments. Yet the Federal Circuit has held that "an interpretation which excludes a disclosed embodiment from the scope of the claim is rarely, if ever, correct." *Broadcom Corp. v. Emulex Corp.*, 732 F.3d 1325, 1333 (Fed. Cir. 2013) (quotation omitted). Reading out an embodiment "would require highly persuasive evidentiary support" and is inappropriate when "the specification, including the claims, supports a reading that encompasses the preferred embodiment." *SynQor, Inc. v. Artesyn Techs., Inc.*, 709 F.3d 1365, 1378–79 (Fed. Cir. 2013) (quotation omitted). Not only has Samsung failed to present any such evidence here, but also it seeks to exclude not just one embodiment, but four of them. Accordingly, the Court should reject Samsung's construction and apply the plain and ordinary meaning of this term.

D. "Plastic"

Term	**Asserted Claims**	**Largan's Construction**	**Samsung's Construction**
"plastic"	'602 Patent, Claims 1, 2 '807 Patent, Claims 2, 22 '860 Patent, Claim 2	This term needs no construction and should be given its plain and ordinary meaning.	"synthetic material distinct from glass"

"Plastic" does not need a construction and should be given its ordinary meaning. A person of ordinary skill in the art at the time of the invention would certainly have understood what the word "plastic" means, and most lay jurors will

have no trouble understanding it either. Accordingly, no construction is needed.

During the claim construction exchanges mandated by the Patent Local Rules, Largan asked Samsung to identify ***any*** non-infringement or invalidity theory affected by this term and Samsung could not identify a single one. To date, Samsung has never articulated why it is so insistent on construing "plastic." The lack of an actual controversy means the Court should not and quite possibly cannot construe this term. *Vivid*, 200 F.3d at 803 ("only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy").

Samsung's construction of "plastic" unnecessarily complicates and confuses something that is inherently understandable. In doing so, it introduces more ambiguity than it resolves. For example, gasoline is a "synthetic material distinct from glass" and thus meets Samsung's construction, yet gasoline is not "plastic." The same is true for a laundry list of man-made crystals, man-made liquids, and man-made gases which are "synthetic materials distinct from glass" yet not plastic.

On the other end of the spectrum, plastic also can be reinforced with small percentages of other material, including glass, and Samsung's construction is ambiguous as to whether it seeks to exclude, for example, plastic reinforced with glass, even though such a lens material is both a "synthetic material" and "distinct from glass." Again, Samsung's construction adds only confusion, not clarity.

In case there were any lingering doubt regarding the clarity of "plastic," Samsung itself uses the identical term "plastic" in its own patents. *E.g.*, Ex. 13, U.S. Patent No. 7,791,818 at 3:40, 8:30, Claim 3; Ex. 14, U.S. Patent No. 8,279,532 at 4:7, 4:16, 4:32, 4:48, 4:58, 4:60, 5:15–16; Ex. 7, U.S. Patent No. 8,665,533 at 5:21, 5:24; Ex. 8, U.S. Patent No. 8,767,314 at Abtract, 1:46–49, 2:35, 2:55–58. Yet, Samsung's patents never define what "plastic" is. As such, Samsung can hardly maintain that "plastic" is not understandable to one of ordinary skill or requires an express construction. *Merck & Co. v. Teva Pharms. USA, Inc.*, 347 F.3d 1367, 1370 (Fed. Cir. 2003) ("In construing patent claims, the court must

apply the same understanding as that of persons knowledgeable in the field of the invention. Patents are written not for laymen, but for and by persons experienced in the field of the invention.") (quotation omitted). Accordingly, the Court should give this term its plain and ordinary meaning.

E. Preambles

Terms
'602 Patent 1. **An optical system for taking image comprising three lens elements with refractive power, from the object side to the image side:**
'807 Patent 1. **An imaging lens assembly comprising, in order from an object side to an image side:** 20. **An imaging lens assembly comprising, in order from an object side to an image side:**
'860 Patent 1. **An optical lens system comprising, in order from an object side to an image side:**
'190 Patent 1. **An imaging lens system including, in order from an object side to an image side:** 21. **An imaging lens system including, in order from an object side to an image side:**
'191 Patent 1. **An imaging lens system including, in order from an object side to an image side:** 12. **An imaging lens system including, in order from an object side to an image side:** 22. **An imaging lens system including, in order from an object side to an image side:**

Largan's Construction	Samsung's Construction
The preambles are not properly before the Court. In the event the Court considers a "general" construction of the preambles, it should find that they are not limiting, consistent with Federal Circuit precedent.	The preambles of the independent claims in the '602,'807,'860, '190, and '191 Patents are limiting because they recite essential structure or steps and/or are necessary to give "life, meaning, and vitality" to the claims. *See, e.g.*, *Catalina Mktg., Int'l v. Coolsavings.com*, 289 F.3d 801, 808 (Fed. Cir. 2002).

As a preliminary matter, Samsung's request to construe nine different preambles from five patents as "limiting" is not properly before the Court. Samsung identified only one specific preamble term in its preliminary proposed constructions (Patent L.R. 4.1.a) and its responsive proposed constructions (Patent L.R. 4.1.c), and the only claim in which that preamble term appeared is no longer at issue. Ex. 15, Samsung Identification of Proposed Terms and Claim Elements for

Construction (Aug. 1, 2014); Ex. 16, Samsung Identification of Responsive Claim Constructions (Aug. 15, 2014). Samsung waited until the day the parties' Joint Claim Construction Statement was due to argue for the first time that any other preamble—let alone ***nine*** of them—should be construed. The Patent Local Rules are designed to prohibit such dilatory and prejudicial tactics. *See* Patent L.R. 4.1 (requiring exchange "of ***each claim term, phrase, or clause*** which the parties have identified for claim construction purposes") (emphasis added).

In addition, Samsung's proposal exceeds the Court's express limit of ten (10) disputed claim terms.[16] D.I. 38 at 1. Not only are there nine different preambles, but each preamble consists of multiple different terms, each of which must be analyzed separately for whether or not it is a limitation. Using claim 1 of the '602 Patent as an example, whether the phrase "an optical system" is limiting is a different question than whether "for taking image," "three lens elements with refractive power," or "from the object side to the image side" are limiting. This is particularly troubling because the "terms" Samsung has proposed for construction as a "preamble" include 10 to 14 words ***after*** the word "comprising" or "including" that typically indicates the end of the preamble. *See* 37 C.F.R. § 1.75(e). Thus, Samsung appears to be trying to also construe substantive words after the preamble. As such, Samsung's request is an end run around both the Patent Local Rules as well as this Court's order limiting the number of terms.

Because it did not follow the Patent Local Rules in identifying these "preambles," Samsung has deprived Largan and the Court of the information necessary to assess the impact these terms may have on the case. Samsung has not,

[16] During the May 22, 2014 Telephonic Status Conference (D.I. 37), Samsung's counsel confirmed their understanding of the Court's limit of 10 terms for construction and stated that if the limit were not sufficient, it would seek additional terms from the Court "ahead of time." Tr. p.10, ll. 11–18 and p. 15, ll. 9–17. Instead of seeking leave to add the terms in excess of this Court's limit, Samsung waited until the very last minute to unilaterally propose a "general" construction of nine preambles with multiple constituent terms without permission.

for example, proposed any specific construction for these phrases, nor identified what "structure or steps" it asserts are recited in them. Furthermore, despite this Court's requirement that "each party shall identify with specificity the impact of the proposed constructions on the merits of the case," Samsung has provided only the conclusory response that "construction of this claim term may impact its non-infringement or invalidity arguments." *See* P.L.R. 4.2(b); Dkt. No. 40-1 (Samsung gave the same non-response for every proposed term). Yet to date, Samsung has not identified ***any*** non-infringement or invalidity argument actually affected by these "preambles." *E.g.*, *Vivid Techs.*, 200 F.3d at 803 ("only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy"). For all of these reasons, Largan requests that the Court refuse to construe Samsung's "preambles" or otherwise hold that they are "limiting."

In the event the Court is willing to consider Samsung's untimely and incomplete request to construe the "preambles" as "limiting," Federal Circuit law is to the contrary. *Am. Med. Sys., Inc. v. Biolitec, Inc.*, 618 F.3d 1354, 1358 (Fed. Cir. 2010). Indeed, the general rule is precisely the opposite—"the preamble does not limit the claims." *Id.*; *Allen Eng'g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1346 (Fed. Cir. 2002). Although a preamble may be found limiting "if it recites essential structure or steps, or if it is 'necessary to give life, meaning, and vitality' to the claim," that determination is made on a case-by-case basis. *American Med. Sys.*, 618 F.3d at 1358 (quoting *Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002)). Here, Samsung has not even attempted to address the individual circumstances for each of the nine "preambles," such as which specific structures are limiting and how those structures are not already encompassed in the claim body, yet that is a fundamental requirement.

III. CONCLUSION

For the foregoing reasons, Largan respectfully requests that the Court find the disputed terms should be given their plain and ordinary meaning, and that

Samsung's imprecise and litigation-inspired constructions should be denied.

DATED: October 10, 2014

PERKINS COIE LLP

By: *s/ Kimberly I. Kennedy*

John P. Schnurer, Bar No. 185725
JSchnurer@perkinscoie.com
Joseph P. Reid, Bar No. 211082
JReid@perkinscoie.com
Michael J. Engle, Bar No. 259476
MEngle@perkinscoie.com
Kimberly I. Kennedy, Bar No. 253828
KimberlyKennedy@perkinscoie.com
John D. Esterhay, Bar No. 282330
JEsterhay@perkinscoie.com
Perkins Coie LLP
11988 El Camino Real, Suite 350
San Diego, CA 92130-2594
Telephone: 858.720.5700
Facsimile: 858.720.5799

Attorneys for Plaintiff and Counterclaim Defendant Largan Precision Co., Ltd.

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the above and foregoing document has been served on October 10, 2014 to all counsel of record who are deemed to have consented to electronic service via the Court's CM/ECF system. Any other counsel of record will be served by electronic mail.

s/Kimberly I. Kennedy
Kimberly I. Kennedy

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