ROBERT T. HASLAM (Bar No. 71134)
rhaslam@cov.com
MICHAEL K. PLIMACK (Bar No. 133869)
mplimack@cov.com
CHRISTINE SAUNDERS HASKETT (Bar No. 188053)
chaskett@cov.com
SAMUEL F. ERNST (Bar No. 223963)
sernst@cov.com
COVINGTON & BURLING LLP
One Front Street
San Francisco, CA 94111
Telephone: (415) 591-6000
Facsimile: (415) 591-6091

ALAN H. BLANKENHEIMER (Bar No. 218713)
ablankenheimer@cov.com
LAURA E. MUSCHAMP (Bar No. 228717)
lmuschamp@cov.com
JO DALE CAROTHERS (Bar No. 228703)
jcarothers@cov.com
CHRISTOPHER J. LONGMAN (Bar No. 234473)
clongman@cov.com
COVINGTON & BURLING LLP
9191 Towne Centre Drive, 6th Floor
San Diego, CA 92122-1225
Telephone: (858) 678-1800
Facsimile: (858) 678-1600

Attorneys for Defendants and Counterclaimants SAMSUNG ELECTRONICS CO., LTD., SAMSUNG SEMICONDUCTOR, INC., SAMSUNG AUSTIN SEMICONDUCTOR, LLC, SAMSUNG ELECTRONICS AMERICA, INC., SAMSUNG TELECOMMUNICATIONS AMERICA, LLC, SAMSUNG TECHWIN CO., LTD., and SAMSUNG OPTO-ELECTRONICS AMERICA, INC.

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

ADVANCED MICRO DEVICES, INC., et al.,

Plaintiffs and Counterdefendants,

v.

SAMSUNG ELECTRONICS CO., LTD., et al.,

Defendants and Counterclaimants.

Case No. 3:08-CV-0986-SI

DEFENDANT AND COUNTERCLAIMANT SAMSUNG ELECTRONICS CO., LTD.'S OPENING CLAIM CONSTRUCTION BRIEF

PUBLIC REDACTED VERSION

DATE: May 6-7, 2009
TIME: 3:30 p.m.
COURTROOM: 10, 19th Floor
JUDGE: The Honorable Susan Illston

TABLE OF CONTENTS

TABLE OF AUTHORITIES

Page(s)

CASES

STATUTES

I. INTRODUCTION

Plaintiff and Counterdefendant AMD seeks to evade its infringement of Samsung's asserted patents by improperly importing limitations from the preferred embodiments and from claim preambles—claim construction tactics that have been squarely rejected by the Federal Circuit. The Court should instead adopt the claim constructions proposed by Samsung, which are firmly supported by the intrinsic evidence most relevant to claim construction: the language of the claims themselves and the patent specification.

The first Samsung patent at issue is U.S. Patent No. 5,740,065 ("the '065 patent"). The '065 patent claims methods for controlling the many manufacturing processes used to make semiconductor chips, including the process used to align the various layers that are formed on a semiconductor wafer. AMD first contends that the term "information corresponding to an alignment state" should be limited to the specific alignment measurement suggested in a preferred embodiment discussed in the patent specification. AMD's construction ignores the claim language, which uses the general term "information," rather than more specific terms used by the patentees elsewhere in the patent to describe specific alignment measurements. AMD's construction also disregards other portions of the specification making clear that *any* type of information may be used. Instead, the Court should construe the term to mean information "relating to a lower layer or a reference layer formed during the manufacturing process of a semiconductor device," because that construction is firmly grounded in the intrinsic patent evidence.

Second, AMD asserts that the term "extracting a correction condition," as used in the '065 patent, is indefinite. However, the claim language itself states how to extract a correction condition. Moreover, the specification provides two specific examples of how to extract a correction condition. Accordingly AMD cannot prove by clear and convincing evidence that this term renders the claims indefinite. Instead, the Court should construe "extracting a correction condition" to mean, "creating a value or data set to be used to affect the determination of a current working condition."

Third, AMD seeks to limit the term "accumulatively averaging working conditions," as used in the '065 patent, to one very specific mathematical algorithm. AMD's proposed construction of

this term is so narrow that it even excludes the specific equation that is used in the preferred embodiment. And even if AMD's proposed construction were identical to the equation used in the preferred embodiment, such a construction would still be inappropriately narrow. Rather, an accumulative average merely refers to a value representative of a set of values that can be obtained by applying a variety of mathematical algorithms.

The second Samsung patent at issue is U.S. Patent No. 5,781,750 ("the '750 patent"). The '750 patent claims systems and methods that allow computers to efficiently execute two or more sets of instructions. AMD asks the Court to construe a term, "separate instruction sets," that appears only in the preambles of the two asserted claims of this patent. This preamble term requires no construction because when, as here, the preamble adds no limitations to those found in the body of the claim, it is irrelevant to the proper construction of the claim. If, however, this term were construed, the Court should reject AMD's improper attempt to limit the term to the specific instruction sets (known as "CISC" and "RISC") that are described in the preferred embodiment of the '750 patent. The Court should also reject AMD's attempt to incorporate properties related to encoding of instruction sets into this term because it would impermissibly render other limitations of the same claims superfluous. Instead, the Court should adopt Samsung's straightforward construction that "separate instruction sets" means "distinct groups of instructions."

II. THE TECHNOLOGY AT ISSUE AND THE ASSERTED PATENTS

A. U.S. PATENT NO. 5,740,065

1. The '065 Patent Relates to Process Control for Semiconductor Fabrication.

The '065 patent claims methods for controlling the many complex processes used to fabricate semiconductor chips from silicon wafers. Semiconductor chips are fabricated using a variety of interrelated processing techniques, which must be performed with a high degree of precision at a microscopic or sub-microscopic level. Some of these processing techniques include:

- Photolithography: a process whereby a photoresist is placed on the substrate, and a desired geometric pattern is created through the exposure of the photoresist to light.

- Etching: a process whereby thin layers of the substrate are removed by chemicals, reactive gases, a bombardment of ions or other techniques.
- Doping: a process whereby dopant ions (such as boron or phosphorous) are implanted onto a region of the substrate in order to modify the electrical conductivity of that region.
- Chemical mechanical polishing (or planarization): a process used to make level the layers of the semiconductor substrate through a combination of chemical corrosion and polishing.

See, e.g., '065 patent at 1:12-18, 31-33, 45-48.

There are many variables that can be controlled in these fabrication processes, such as, for example: the precise length of time a photoresist is exposed to light; the accelerating voltage developed in the etcher; and the length of time used for polishing or etching. *See, e.g.*, '065 patent at 1:20-23, 42-55. The inventors of the '065 patent refer to these variables and the machine settings used to control them as "working conditions." *See, e.g. id.* at 1:67-2:2; 2:31-36. Due to such factors as worker error in handling the equipment, uncontrolled drift in the equipment settings, or variations in the equipment used, it is challenging to control these working conditions such that chips are manufactured with a desired level of uniformity from lot to lot. *Id.* at 1:65-2:11.

The methods and techniques for controlling working conditions in order to achieve precision and uniformity in the fabrication process are often referred to as "process control."

2. Prior Art Methods of Process Control.

Prior to the inventions claimed in the '065 patent, process control was often achieved through sampling methods. '065 patent at 1:24-55. Before starting a process for a lot of semiconductor wafers, one or more sample wafers would be subjected to the process. *Id.* at 1:24-26. Certain results of the process (e.g., layer thickness or alignment) would be measured, and the variables described above (e.g., exposure or etching time) would be adjusted to account for any error prior to running the entire lot. *Id.* at 1:25-55.

The '065 patent identifies several problems with this sampling method. Sampling is inefficient, adding considerable time to the production process. '065 patent at 1:57-64. Moreover, the accuracy of the sampling process is vulnerable to worker error in setting the working conditions of the equipment or in making measurements. *Id.* at 1:65-2:5. If such errors are committed in the

sampling process, it will contaminate the entire lot of wafers. *Id.* at 1:67-2:5. Accordingly, the sampling method is often not reliable and its results not reproducible. *Id.* at 2:6-11.

3. The Inventions of the '065 Patent.

The inventions claimed in the '065 patent represent a radical departure from the prior art in that they dispense with the need to use sampling to control fabrication processes, while at the same time providing a method of process control that is more accurate and reliable than sampling methods. '065 patent at 2:15-26. The patent describes two innovations that achieve this purpose.

a. The Patented Methods Take into Account Working Conditions from Lots Prior to the One Currently Being Processed.

First, rather than using samples, the patented methods make use of information regarding working conditions (such as exposure or etching time) gathered from previous lots of semiconductor wafers that have undergone the process to be controlled. '065 patent at 2:31-35.

All of the claims of the '065 patent incorporate this first innovation, describing methods that take into account working conditions from prior lots. These working conditions are accumulatively averaged to arrive at what the patentee terms an "optimal working condition." *Id.* The current lot is then processed according to the optimal working condition. The sampling process can thereby be avoided, reducing processing time and improving reliability. *Id.* at 2:15-18, 29-30, 32-35.

b. The Patented Methods Take into Account Information Related to Previous Layers in the Lots Currently Being Processed.

Second, claims 1-7 and 9-10 achieve high accuracy and reliability by not only taking into account working conditions from prior lots, but also taking into account "information" relating to an alignment state of a lower layer on the current lot, to arrive at what the patentee terms a "correction condition." *Id.* at 2:36-40, cls. 1-7, 9-10. The information regarding the lower layer is a broader category of information than the measurements that are taken after the process is completed. *Id.* at 1:52-53, cl. 8. The information extracted to determine a correction condition can include measurements related to alignment, such as the positional error in comparison to a lower layer (*id.* at 3:61-66); but the correction condition can alternatively be determined using other types of information related to alignment, such as the identification of particular equipment that was used to process the lower layer. *Id* at 5:54-57.

According to the method set forth in claim 1, the correction condition is combined with the working conditions from previous lots to arrive at the current working condition for the present lot. *Id.* at 2: 39-41, cl. 1. Claim 1 provides as follows:

> **1.** A method for manufacturing a semiconductor device with manufacturing equipment performing a process having a working condition, said manufacturing equipment being adapted to manufacture said semiconductor device in units of lots, said method comprising the steps of:
>
> extracting an optimal working condition by accumulatively averaging working conditions of lots previously processed using said process performed by said manufacturing equipment;
>
> extracting a correction condition by extracting information corresponding to an alignment state of said process;
>
> setting a current working condition by adding said correction condition to said optimal working condition; and
>
> performing said process for an entire lot according to said current working condition.

By taking into account working conditions from previous lots and information related to underlying layers of the present lot, the patented methods are more reliable than the prior art sampling methods because they enable automated control systems; and they eliminate the added time of running samples.

The patented methods can perhaps best be understood with reference to an analogy. Because depositing submicroscopic features on a semiconductor chip accurately is subject to such variables as equipment drift and worker error, it is akin in some sense to aiming arrows at a target, which is a process affected by such variables as the wind and error by the individual archers. In order to account for these variables in aiming an arrow, one could take into account the average error or distance from the bull's-eye of the previous arrows that were fired. This would be akin to averaging working conditions in the patented methods. One could then improve the reliability of this working condition by applying a correction condition, which would be based on information particularly relevant to the arrow about to be fired. For example, one might take into account the identity of the archer who is to take the current shot. Including this information in the determination of the optimal working condition, one could include in the average only those

previous shots that were taken by the same archer. It is readily apparent that correcting the working condition in this way results in a more accurate working condition for aiming the next shot.

c. The Preferred Embodiments Apply the Patented Methods to Particular Processes and Use Only One Set of Mathematical Formulas from the Many That Are Available.

The patent specification describes as a preferred embodiment the patented methods as applied only to a photoresist alignment and exposure process and further sets forth one particular set of mathematical formulas as an example of how the patented methods might be implemented. *See* '065 patent at 2:63-4:18. This example is the embodiment to which AMD is asking the Court improperly to limit the claims.

In the example embodiment, the patented methods are applied to determine working conditions for an alignment and exposure process, such as, for example, "exposure time, focus offset, spatial shifts X and Y, X-Y scaling, wafer rotation, orthogonality, and so on, i.e., the elements affecting the alignment & exposure process of the wafer." '065 patent at 3:21-25. In order to determine the "optimal working condition," measurements of the exposure condition from previous lots that are within a standard deviation are selected for inclusion in an equation that is suggested by the patentee for this embodiment. '065 patent at 3:29-53. This particular equation includes a "correction element," which is derived by subtracting an objective value from a "resultant" value obtained from the previous lots. *Id.* at 3:43-47.[1] This is a particular embodiment of the first element of the independent claims of the patent (claims 1 and 8) that the patentee suggests would be one appropriate way to determine an optimal working condition.

Next, a correction condition is obtained by extracting information related to the alignment state of a lower layer of the lot currently being processed. *Id.* at 3:55-4:12. In this example embodiment, the information to be extracted is the "alignment state of the alignment key" from the lower layer. '065 patent at 3:61-64. This refers to a particular alignment measurement from a

[1] This "correction element" is not to be confused with the "correction condition" that is obtained as the second element of claim 1. Rather, the "correction element" is simply one input into the equation suggested in this preferred embodiment for averaging the working conditions of prior lots, as claimed in element 1 of the independent claims (claims 1 and 8).

lower layer, relating to a "key" that is used to determine if subsequent layers are properly aligned. This measurement is input into an equation suggested by the patentee in order to determine an "alignment parameter." '065 patent at 3:55-4:12. This is a particular embodiment of the second element of claim 1. Dependent claim 4 is limited to a process whereby the current working condition is set by determining such an alignment parameter value. *Id.*, cl. 4. But in independent claim 1, the "information corresponding to an alignment state" that is used to extract the correction condition can be information other than an alignment parameter; such as, for example, information regarding which equipment was used to process the lower layer. *Id.* at 5:54-57.

Finally, both the optimal working condition and the correction condition are input into the alignment and exposure device to determine the optimal conditions for the lot currently being performed. '065 patent at 4:13-18. This corresponds to the third and fourth elements of claim 1.

B. U.S. PATENT NO. 5,781,750

The '750 patent discloses a device and method for improving the efficiency of computers that are designed to execute two or more instruction sets. '750 patent at 1:22-24.

Personal computers (PCs) have Central Processing Units ("CPUs") that operate by executing instructions in the order specified by a given software program. Typically, different CPUs are capable of executing different sets, or groups, of instructions. When new CPUs are introduced, a need often arises to be able to execute not only software programs written for the new CPUs, but also software programs written for the older CPUs. For that to be possible, the new CPU typically must be able to execute at least two instruction sets.

For example, early PCs typically had CPUs designed to execute an instruction set composed of a large number of different types of instructions and options for each instruction. *Id.* at 1:27-38. A disadvantage of this approach was that the CPU had to handle the complexities associated with so many different and complex instructions, resulting in slower system performance. *Id.* at 1:43-46. To avoid this problem, newer PCs typically have CPUs designed to operate with a reduced set of less complex instructions. *Id.* at 1:39-54. These simpler instructions can be executed much faster than the complex instructions typically used by older CPUs. *Id.* at 1:46-54.

In this example, the newer PCs must also be able to run software that was written for older PCs, even though the instructions sets for the CPUs differ. In order to meet this need, the newer computers must be able to translate all of the instructions in an older software program to ones that can be executed by the newer PC. This translation, often called decoding, can be accomplished in hardware or in software. Hardware translation is much faster, but the design of the hardware for a CPU that handles two full instruction sets would be extremely difficult and expensive due to the size and complexity that would be required. In contrast, software translation is slower, but it is easier and less expensive to implement because it involves programming the CPU rather than designing the hardware for the CPU. *See* '750 patent, 2:66-3:56; 5:4-5:22.

The inventions claimed in the '750 patent allow designers to combine the benefits of the hardware and software methods described above. As disclosed in the '750 patent, when two instruction sets can be executed by the same CPU, most, if not all, of the instructions in one instruction set are translated (or decoded) in hardware. For instructions from the second instruction set, those instructions that are used most frequently by software applications are decoded in hardware (because it greatly increases speed), and those that are used less frequently are decoded in software to decrease the complexity of the hardware design. *See* '750 patent, 8:1-39, 9:1-63. The preferred embodiments of the inventions describe particular CPUs that are capable of executing two particular instruction sets: the Complex Instruction Set Computer ("CISC") instruction set and the Reduced Instruction Set Computer ("RISC") instruction set. As explicitly contemplated, however, claims 1 and 14 are equally applicable to any CPU that can execute at least two instructions sets in the manner claimed. *See* '750 patent, 5:4-9.

III. ARGUMENT

A. The Court Should Adopt Samsung's Proposed Constructions of the Disputed Terms of the '065 Patent.

1. The Court Should Reject AMD's Attempt to Restrict "Corresponding to an Alignment State" to Information Relating to the Relative Positions of Layers on a Semiconductor Wafer.

The parties' first disagreement is with regard to how the Court should construe the term, "corresponding to an alignment state." The term is a limitation of claims 1-7 and 9-10, and

describes how one should extract a correction condition to adjust the working condition. One of the steps of the method of claim 1 is "extracting a correction condition by extracting information corresponding to an alignment state of said process." '065 patent, cl. 1.

The parties' disagreement arises because, whereas Samsung has proposed a construction that gives the term the full scope of its meaning in light of the claim language and the specification, AMD proposes to use the term to limit the claims to a preferred embodiment related to controlling the exposure process described in the section of the patent entitled, "Detailed Description of the Preferred Embodiment." The parties' respective proposed constructions are as follows:

Proposed constructions of "corresponding to an alignment state"	
Samsung's proposed construction	**AMD's proposed construction**
"Relating to a lower layer or a reference layer formed during the manufacturing process of a semiconductor device."	"Relating to the relative position of one layer on a semiconductor wafer as compared to another layer on the same wafer in a photolithography application."

Although the claim language states that one need only gather "information corresponding to an alignment state," AMD proposes restricting the term to collecting one specific piece of information: "the relative position of one layer on a semiconductor wafer as compared to another." This is merely one of many possible pieces of information relating to an alignment state. Other examples could include reflectivity of the individual wafers and, as the patent specifically mentions, the identification of the particular equipment that was used to process the lower layer in the current lot. *See, e.g., id.* at 5:54-57. Samsung proposes giving the term the full scope of its meaning as set forth in the claims, which allow for one to extract any "information" relating to the alignment of a lower layer.

Samsung's construction is supported by the claim language. The claim language uses the broad term "information" to describe what is to be collected to extract the correction condition. This is in contrast to the use of the more specific terms "check result" or "resultant value" used elsewhere in the patent to describe specific measurements taken at the completion of the process. "Check result" or "resultant value" refer specifically to measurements, such as layer thickness,

critical dimension ("CD"),[2] and the particular alignment measurement to which AMD seeks to restrict the term "information." *Id.* at 1:48-55, cls. 7, 8, 12. Claim 8 and its dependent claims describe a process whereby a "resultant value" of performing the process is measured, and this measurement is used to reset the current working condition. Claim 1, on the other hand, claims a different method of determining the current working condition by extracting a "correction condition." This claim uses the general term "information" to describe what information is to be gathered from the underlying layer to determine the correction condition, not the specific type of "resultant value" information used in claim 8 and its dependents. "In the absence of any evidence to the contrary, we must presume that the use of these different terms in the claims connotes different meanings." *CAE Screenplates Inc. v. Heinrich Fielder GMBH*, 224 F.3d 1308, 1317 (Fed. Cir. 2000). In this case, whereas claims 8-12 require the gathering of particular measurements or "resultant values" from prior lots, the very different method of claim 1 allows for the gathering of any type of "information" from a lower layer to extract a "correction condition."

Samsung's construction is consistent with the patent specification. The "optimal working condition" is to be derived from accumulatively averaging working conditions from prior lots. '065 patent at 2:31-35. This step in the process largely determines the current working condition but is subject to a possible correction based on information derived from a lower or reference layer. *Id.* at 2:36-38. Any "information" regarding the alignment state of the lower layer will suffice to derive a correction. For example, the patentee states that one can "minimize errors generated in the alignment & exposure process" by including in the calculation of the optimal working condition "parameters . . . for processing using the same equipment." *Id.* at 5:54-57. Under these circumstances, the "information" to be derived to extract the "correction condition" is the particular equipment or tools that were used to process the lower layer; only those parameters or working conditions from prior lots that were processed using the same equipment as the current lot might be included in the calculation of the optimal working condition. Samsung's construction of

[2] "Critical dimension" refers to the feature on the device whose control is the most critical dimension for the proper operation of the finished device. It is frequently the smallest feature or dimension on the device.

"corresponding to an alignment state" properly accounts for this broad disclosure in the specification – that the "information corresponding to an alignment state" can be a broad range of information, and not just the specific measurement of relative position, as AMD contends.

AMD's narrow construction must be rejected because it limits the claims to one particular aspect of a preferred embodiment. The preferred embodiment includes as one of the inputs into a suggested equation for deriving the correction condition an "alignment state of the alignment key." *Id.* at 3:61. This is the particular measurement to which AMD would limit the "information" to be derived to extract a correction condition.

The Federal Circuit has emphasized repeatedly that "although the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1323 (Fed. Cir. 2005) (en banc). The Federal Circuit applied this principle again in the recent case of *Ventana Medical Systems, Inc. v. Biogenex Laboratories, Inc.*, 473 F.3d 1173 (Fed. Cir. 2006). In *Ventana* the patents-in-suit related to methods and apparatuses for staining microscope slides. *Id.* at 1176. The claims required the step of "dispensing reagents onto a slide," and the district court limited the claim term "dispensing" to "direct dispensing," "because all of the disclosed embodiments dispense reagent directly from the bottom of the container without using any intermediate transfer device." *Id.* at 1178. The Federal Circuit vacated the claim construction and remanded because the claims "do not contain any language that could be read to limit the term 'dispensing' to require 'direct dispensing.'" *Id.* at 1180. The court held that "[a]lthough the preferred embodiments . . . contain a 'direct dispensing' feature, the inventors were not required to claim this feature in the '861 patent and, indeed, did not do so." *Id.* at 1181-82.

Similarly here, the claims do not contain any language that could be read to limit the term "information corresponding to an alignment state" to "the relative position of one layer on a semiconductor wafer as compared to another layer on the same wafer." Although this is some of the information used to determine the correction condition in the preferred embodiment, the patentees chose not to claim this as a limitation.

2. The Term "Extracting a Correction Condition" is Not Indefinite Because the Intrinsic Evidence Indicates that it Means "Creating a Value or Data Set to be Used to Affect the Determination of a Current Working Condition."

The parties' proposed constructions of "extracting a correction condition" are as follows:

Proposed constructions of "extracting a correction condition"	
Samsung's proposed construction	**AMD's proposed construction**
"Creating a value or data set to be used to affect the determination of a current working condition."	The claim term is indefinite; or "Subtracting an objective value from a resultant value so that, when this difference value is added to the optimal working condition, a process can be performed without error."

Samsung proposes that the term "extracting a correction condition" be construed according to its consistent use throughout the patent to mean "creating a value or data set to be used to affect the determination of a current working condition." First, the claims themselves explain that the correction condition is derived "by extracting information corresponding to an alignment state of said process" and is then used in the process of "setting a current working condition." '065 patent, cl. 1. Similarly, the specification explains that one extracts a correction condition "by extracting information" and that the current working condition is determined by using this information to correct the optimal working condition. '065 patent, Abstract, 2:31-41.

This correction condition can encompass either a value or a data set. The specification makes clear that the correction condition can be a data set, used, for example, to determine which of the working conditions from prior lots are selected to extract the "optimal working condition." For example, the specification states that working conditions from prior lots processed using the same equipment can be selected to calculate the optimal working condition. *Id.* at 5:54-57.

Elsewhere in the patent, a preferred embodiment explains how to extract the correction condition by calculating a value. *Id.* at 3:55-4:12. Dependent claim 6 also claims a method wherein the correction condition is a value, determined by "multiplying a correction value by a gain whose value is determined according to an amount of correlation between lots." Samsung's proposed construction is consistent with these disclosures in the specification: "creating a value or data set to be used to affect the determination of a current working condition."

AMD first argues that the term is "indefinite" under 35 U.S.C. § 112. "[D]etermination of claim indefiniteness is a legal conclusion . . . ." *Personalized Media Commc'ns, L.L.C. v. Int'l Trade Comm'n*, 161 F.3d 696, 705 (Fed. Cir. 1998). "The standard of indefiniteness is somewhat high . . . ." *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1342 (Fed. Cir. 2003). "If the meaning of the claim is discernible, even though the task may be formidable and the conclusion may be one over which reasonable persons will disagree, we have held the claim sufficiently clear to avoid invalidity on indefiniteness grounds." *Exxon Research & Eng'g Co. v. United States*, 265 F.3d 1371, 1375 (Fed. Cir. 2001).

The term "extracting a correction condition" is not indefinite. In fact, the '065 specification provides at least two exemplary methods for extracting a correction condition. One method is to determine which tools were used to process the current lot and apply this information as a correction condition to select only those working conditions from prior lots that were processed with the same tools. *Id.* at 5:54-57. Another method involves measuring the alignment error based on a reference layer and then inserting this information into a suggested equation to obtain a value for the correction condition. *Id.* at 3:55-4:12. Because the claims state that what is claimed is the use of information related to the alignment state of a lower layer as a correction condition, and because the specification provides at least two examples of the types of information that could be used for this purpose, the claim term is sufficiently definite.[3]

Despite arguing that this claim term is indefinite, AMD offers a proposed construction in the alternative: "Subtracting an objective value from a resultant value so that, when this difference

---

[3] REDACTED

value is added to the optimal working condition, a process can be performed without error." This construction is nothing more than a phrase in the description of the preferred embodiment that is describing one step in deriving the "optimal working condition," not the "correction condition." In the preferred embodiment, one input into the equation suggested by the patentees for deriving an optimal working condition for an exposure process is a "correction element obtained by *subtracting an objective value from a resultant value.*" *Id.* at 3:43-45 (emphasis added). The patentee discusses the extraction of the claimed "correction condition" in this preferred embodiment separately, in the subsequent paragraph. *Id.* at 3:55-4:18. The Court should therefore reject AMD's construction, not only because it is an improper attempt to import limitations from the preferred embodiment, but also because it is an attempt to import a limitation from a portion of the specification that is addressing an entirely different claim element.

The term should be given the full scope of its meaning: "creating a value or data set to be used to affect the determination of a current working condition."

3. The Court Should Reject AMD's Attempt to Restrict "Accumulatively Averaging Working Conditions" to the Exemplary Mathematical Formulas Set Forth in the Preferred Embodiments.

The parties' respective proposed constructions of "accumulatively averaging working conditions" are as follows:

Proposed constructions of "accumulatively averaging working conditions"	
Samsung's proposed construction	**AMD's proposed construction**
"Performing a mathematical operation on a set of working conditions to determine a value representative of the set."	"For each parameter comprising a working condition, individually summing over previous values of that parameter and dividing the result by the total number of terms in the summation. In an accumulative average, the number of terms in the average grows by one as each new value is calculated. A working condition is a group of settable parameter values that control alignment and exposure in a semiconductor manufacturing process."

The term "accumulatively averaging working conditions" describes one step in extracting the "optimal working condition." The claims require "extracting an optimal working condition by accumulatively averaging working conditions of lots previously processed." '065 patent, cl. 1.

As with the other disputed terms from the '065 patent, AMD is attempting to use this term to limit the claims to the preferred embodiment. That preferred embodiment suggests selecting the working conditions within a standard deviation of a reference value, adding them together, and dividing them by a value representative of the number of processes that have been performed. *Id.* at 3:31-54. However, AMD's proposed construction is not even broad enough to encompass all aspects of this preferred embodiment because the embodiment also suggests introducing a "correction element" into the equation, which is "obtained by subtracting an objective value from a resultant value." *Id.* at 3:44-45. The resulting equation suggested in the preferred embodiment for deriving the optimal working condition in this context is therefore more complicated than the simple, narrow equation to which AMD proposes restricting this term. Because it is improper to construe the claims so as to exclude a preferred embodiment, AMD's overly narrow proposed construction must be rejected. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996) (a claim construction excluding a preferred embodiment is "rarely, if ever, correct and would require highly persuasive evidentiary support, which is wholly absent in this case").

In fact, to one of ordinary skill in the art, "accumulatively averaging" is a broad term that encompasses any mathematical operation that determines a value representative of a particular set of values. This is reflected in the preferred embodiment, which suggests using a set of previous working conditions that are within a standard deviation of a reference value; and inputting this set of values into a suggested equation to determine a single value representative of the set. '065 patent at 3:31-43. It is also reflected elsewhere in the specification, where the patentees indicate that the set of working conditions to be selected might be the working conditions from prior lots using the same equipment or tools as the underlying layer of the current lot. *Id.* at 5:54-57.

Learned treatises contemporaneous with the patented inventions confirm that the term "average" is not limiting with respect to the particular equation used; rather it refers to any mathematical operation that reduces a data set of values to a single, representative value. The 1991 text, *Introduction to Statistical Quality Control*, discusses mathematical formulas that can be used

to derive an accumulative average other than the one to which AMD would limit the term.[4] Ernst Decl., Ex. 2 at 279-312. For example, one formula that is useful in statistical quality control is the "exponentially weighted moving average," or the EWMA.[5] *Id.*, Ex. 2 at 299-309. As the text indicates, the EWMA is just one type of average. *Id.*, Ex. 2 at 300 ("[T]he EWMA . . . is a weighted average.") ("[T]he EWMA is sometimes called a geometric moving average.") ("[T]he EWMA can be viewed as a weighted average of all past and current observations."). And the EWMA performs exactly the function of the "accumulatively averaging" term of the patent: that of accounting for variations in the process that occur over time. *Id.*, Ex. 2 at 304 (explaining that the EWMA has the "ability to *monitor* a process and detect the presence of assignable causes that result in a process shift") (emphasis in original).[6] Accordingly, the term "average" was understood, at the time of the inventions of the patent, to apply to a variety of different formulas that provide a representative value to be used to control a process over time.[7]

[4] The *Introduction to Statistical Quality Control* text is a book that discusses concepts used in the specific field to which the '065 patent relates – that is, the field of semiconductor manufacturing process control. *See, e.g., id.*, Ex. 2 at 277-278 (discussing examples involving the processing of semiconductor wafers); 313 ("Statistical process-control methods have found wide application in almost every type of business.").

[5] An exponentially weighted moving average refers to an average that weighs older data exponentially less than it weighs newer data.

[6]

REDACTED

[7] *See also id.*, Ex. 2 at 307-309 (describing yet another example of a type of average that can be used: the *unweighted* moving average).

Samsung's construction is also consistent with contemporaneous dictionary definitions. Webster's dictionary defines an "average" as "a single value (as a mean, mode, or median) that summarizes or represents the general significance of a set of unequal values." *Id.*, Ex. 3 at 80. The definition of "accumulate" adds to this the concept of gathering the set of values as lots are performed: "to gather or pile up esp. little by little . . . to increase gradually in quantity or number." *Id.*, Ex. 3 at 8. These definitions are consistent with the construction Samsung proposes for "accumulatively averaging working conditions": "performing a mathematical operation on a set of working conditions to determine a value representative of the set." Because there is nothing in the term "accumulatively averaging" that would require the application of the specific algorithm AMD proposes in order to arrive at this value, the Court should adopt Samsung's broader construction.[8]

B. The Court Should Adopt Samsung's Position Regarding the Disputed Term "Separate Instruction Sets" in the '750 Patent.

1. The Preambles of Claims 1 and 14 are Not Limiting, and the Disputed Term Therefore Does Not Need to Be Construed.

As a threshold matter, the disputed term "separate instruction sets," need not be construed by the Court because it appears only in the preambles of the asserted claims, which, in this case, are not limiting. When the preamble of a claim "adds no limitations to those in the body of the claim, the preamble is *not* itself a claim limitation and is irrelevant to proper construction of the claim." *IMS Tech., Inc. v. Haas Automotive, Inc.*, 206 F.3d 1422, 1434 (Fed. Cir. 2000) (emphasis added). Here, the term "separate instruction sets" in the preambles is not referenced as an antecedent by either claim 1 or claim 14. Rather, it merely provides a descriptive vantage for viewing the limitations of the bodies of the two claims, which, by themselves "completely set forth the

[8] In addition, the Court should reject the portion of AMD's construction limiting the term "working condition" to "a group of settable parameter values that control alignment and exposure." The term "working conditions" is used broadly in the patent to refer to the measurements and corresponding machine settings used to control any fabrication process, not just alignment and exposure. In describing the prior art, the patentee states explicitly that "alignment and exposure" processes are described merely "for convenience sake." '065 patent at 1:31-33. There is no basis for importing this limitation into the claims. The term "working condition" is moreover used in claim 8, which has no language to suggest it is limited to an alignment and exposure process.

invention" as required. *Id.* For example, the body of claim 1 fully sets out the meaning of the claimed first and second instruction sets:

> first instruction decode means for decoding instructions from a first instruction set, said first instruction set having a first encoding of instructions;
>
> second instruction decode means for decoding only a second subset of instructions from a second instruction set, said second instruction set having a second encoding of instructions, said first encoding of instructions independent from said second encoding of instructions;
>
> ...
>
> whereby instructions from both said first instruction set and said second instruction set are executed by said CPU.

'750 patent, cl. 1 (emphasis added).[9]

In light of the detailed treatment of "instruction sets" in the body of each claim, there is nothing for the preamble phrase "separate instruction sets" to add to the meaning of the claim.

2. Alternatively, the Court Should Adopt Samsung's Straightforward Construction and Reject AMD's Proposed Construction that Impermissibly Reads in Limitations from the Specification and from Separate Limitations in the Same Claims.

If the Court construes "separate instruction sets," it should adopt Samsung's construction. Defining the term to mean "distinct groups of instructions" not only gives the term the full scope of its ordinary meaning, but also has the additional benefit of brevity. By contrast, AMD's proposed construction is a teetering edifice of multiple unsupported and improper limitations piled atop each other. This construction dwarfs the humble phrase "separate instruction sets," adding undefined terms, reading in other express claim limitations, and creating significant risk of jury confusion.

The table below shows the parties' proposed constructions side-by-side:

Proposed constructions of "separate instruction sets"	
Samsung's proposed construction	**AMD's proposed construction**
"Distinct groups of instructions"	"One complex instruction set computer (CISC) x86 instruction set architecture and one reduced instruction set computer (RISC) PowerPC instruction set architecture. These instruction sets have independent encodings of instructions.

[9] Claim 14 similarly details the meaning of the claimed first and second instruction sets. '750 Patent, cl. 14.

	Mere extensions of instruction sets do not constitute separate instruction sets because they have dependent encodings of instructions."

Samsung's proposed construction of "separate instruction sets"—namely "distinct groups of instructions"—fully captures the meaning of the term as it is used in the claim itself. As discussed above, both claim 1 and claim 14 require a "first instruction set" and a "second instruction set," and both claims describe the interactions of those sets with other elements of a CPU (claim 1) or with other steps of a processing method (claim 14). The language of the claim makes clear that these sets—or groups—of instructions are distinct from each other. Therefore, that is the meaning that the Court should adopt if it chooses to construe this term.

AMD's proposed construction improperly attempts to limit the claim to a preferred embodiment. Specifically, AMD's proposed construction of the term "separate instruction sets" would restrict the claim to two particular, specialized instruction sets: CISC x86 and RISC PowerPC instruction set architectures. Though CISC and RISC instruction sets are disclosed as being used in the preferred embodiment of the invention (*see, e.g.*, '750 patent 5:10 - 8:40), and are discussed in the description of the prior art (1:25-2:2), the specification itself makes it explicit that they are but two of many applicable instruction sets contemplated by the claimed invention: "While the detailed description describes the invention in the context of a reduced instruction set computer (RISC) and a complex instruction set computer (CISC), it is contemplated that the invention applies to other instruction sets besides RISC and CISC...." *See* '750 patent, 5:2-8. Accordingly, it would be improper to confine the claims to the RISC and CISC instruction sets described in the preferred embodiment. *See Phillips*, 415 F.3d at 1432.

Moreover, when the inventors of the '750 patent intended to claim a narrower invention limited to RISC and CISC instructions sets, they used specific language to do so, as a comparison of claims 1 and 14 with claims 18 and 15 shows. The latter two claims are substantially similar to claims 1 and 14 except that, instead of using the terms "first instruction set" and "second instruction set" as the asserted claims do, claims 18 and 15 are explicitly limited to, respectively, an apparatus and a method using "a CISC instruction set" and "a RISC instruction set." The use of those express, narrow terms in claims 18 and 15 confirms that, when the inventors used the terms "first

instruction set" and "second instruction set" in claims 1 and 14, the meaning is broader. *CAE Screenplates Inc.*, 224 F.3d at 1317 (there is a presumption that "the use of . . . different terms in the claims connotes different meanings"). AMD's attempt to use a strained reading of a preamble term to destroy that distinction is improper.

Finally, AMD's proposed construction of "separate instruction sets" should be disregarded for the additional reason that it would improperly render other terms within the same claims redundant. *See Innova/Pure Water, Inc. v. Safari Water Filtration Systems, Inc.*, 381 F.3d 111, 1119 (Fed. Cir. 2004) (all claim terms presumed to have meaning in a claim). AMD's proposed construction would freight the three-word phrase with two full additional sentences limiting the "encoding" of these instructions. AMD would have the Court rule that the separate instruction sets "have independent encodings of instructions. Mere extension of instruction sets do not constitute separate instruction sets because they have dependent encodings of instructions." But AMD's proposed construction of this preamble term ignores that both claim 1 and claim 14 deal extensively with the instruction set encoding in the bodies of the claims, setting out the relationship between the instruction sets and their respective encodings. For example, claim 1 specifies that each of the instruction sets described in the claim has, respectively, "a first encoding of instructions" or "a second encoding of instructions." '750 patent, cl. 1. Moreover, the body of the claim is explicit about the relationship between these encodings of instructions: "...said second instruction set having a second encoding of instructions, *said first encoding of instructions independent from said second encoding of instructions*." '750 patent, cl. 1 (emphasis added). AMD's construction of "separate instruction sets" would preempt all of the specific language of claims 1 and 14 concerning 'encoding' with a definition of a preamble term that, on its face, has nothing to do with encoding. Because doing so would deprive those terms of independent meaning, AMD's construction should be rejected.

IV. CONCLUSION

For the foregoing reasons, Samsung requests that the Court adopts Samsung's proposed claim constructions.

DATED: March 16, 2009

COVINGTON & BURLING LLP

By /s/ Robert T. Haslam
ROBERT T. HASLAM

Attorneys for Defendants and Counterclaimants SAMSUNG ELECTRONICS CO., LTD., SAMSUNG SEMICONDUCTOR, INC., SAMSUNG AUSTIN SEMICONDUCTOR, LLC, SAMSUNG ELECTRONICS AMERICA, INC., SAMSUNG TELECOMMUNICATIONS AMERICA, LLC, SAMSUNG TECHWIN CO., LTD., and SAMSUNG OPTO-ELECTRONICS AMERICA, INC.