lowest, adjacent, or highest layer, or an average of all of the nucleation host's layers. (Western Digital Op. Br. at 18.) MR Tech's construction that the hard storage layer has "higher anisotropy than the nucleation host" does nothing to allay this problem. To broaden the anisotropy measurement to any of the "layers in the recording medium," as Western Digital proposes, is needlessly ambiguous and does nothing to help a jury understand the term. Western Digital's modified proposal of "higher anisotropy than any anisotropy in the nucleation host" does not fare better. Given that the claim itself does not clearly state a comparison of the relative anisotropy levels between the nucleation host and hard magnetic storage layer, the construction does not benefit from inclusion of the limitation.

Western Digital's proposed addition of "primarily determines the thermal stability of the recording medium" is not supported by the claims or specification. See Phillips, 415 F.3d at 1313–14 ("[T]he claims of a patent define the invention," as interpreted "in the context of the written description and the prosecution history."). Absent a compelling reason to do otherwise, the Court will not read in claim limitations that are not present in the claim language. See Renishaw PLC v. Marposs Societa' per Azioni, 158 F.3d 1243, 1248 (Fed. Cir. 1998) (noting that claim construction "begins and ends" with the words of the claim). As MR Tech notes, the addition of this language presents new questions such as "how to determine the thermal stability" and "whether a particular layer 'primarily determines' the thermal stability," neither of which are addressed in the specification.

For the foregoing reasons, the Court construes Disputed Claim Term 4 as follows: "a magnetic layer that stores information in magnetically oriented bits."

5. Disputed Term 5: "underlayer"

MR Tech's Proposed Construction	Western Digital's Proposed Construction

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One or more layers on which the hard magnetic storage layer is formed	This claim term is indefinite because it fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention as it relates to "underlayer." In the alternative, the term should be construed as: a single layer on which the hard magnetic storage layer is formed.

a. The Positions of the Parties

MR Tech argues that its construction reflects the plain meaning of "'underlayer' in the context of [perpendicular recording media] to a POSITA [which] refers to one or more layers between the substrate and the hard storage layer." (MR Tech Op. Br. at 22.) MR Tech asserts that a soft underlayer "typically consists of one or more layers and sits between the substrate and the hard storage layer," and the specification "does not disclaim a multilayered underlayer." (Id. at 22–23.) MR Tech points to the prior art *Girt* that "discloses a multilayered underlayer," which the Examiner cited. (Id. at 24.)

Western Digital argues that the "plain and ordinary use" of "underlayer" is singular and not "one or more layers" as construed by MR Tech. (Western Digital Resp. Br. at 15.) Western Digital asserts that MR Tech does not explicitly disclose or imply that an "interlayer" can be included in an "underlayer" the way *Girt* does. (Id.) Western Digital also argues that Claim 1 of the '864 Patent does not specify whether underlayer 7 or underlayer 11b is claimed, and it cannot be both because it is claimed in the singular. (Id. at 16.)

b. Analysis

Western Digital fails to show "by clear and convincing evidence that a skilled artisan could not discern the boundaries of the claim" with respect to the term "underlayer." Dr. Re explains how the patent itself specifies multiple underlayers, specifically layers 7, 9, and 11, and states that "[o]ne of skill in the art would understand that they are each, separately and collectively, the underlayers on which the hard magnetic storage layer (24) is formed." (Re Decl. ¶ 50.) Continuing on, Dr. Re states

that "[a] POSITA is familiar with underlayer, and would consider underlayer to simply refer to the layer or layers between the substrate and the hard magnetic storage layer." (Id. ¶ 51.) Western Digital's alternative construction, which limits the underlayer to "a single layer," expressly contradicts the specification.

For the foregoing reasons, the Court construes Disputed Claim Term 5 as follows: "one or more layers on which the hard magnetic storage layer is formed."

6. Disputed Term 6: "wherein Hm(α) is a field to reduce a normalized magnetization from a saturation to -0.5"

MR Tech's Proposed Construction	Western Digital's Proposed Construction
Plain meaning	Indefinite because the reduction of magnetization is time and temperature dependent.

a. The Positions of the Parties

MR Tech, relying on its expert Dr. Re, argues for plain meaning because "a POSITA would understand that the measurements of Hm(α) should reflect normal operating conditions." (MR Tech Op. Br. at 25.) Western Digital argues indefiniteness because "the claim language would require one to determine the field strength necessary to achieve a particular degree of switching of the magnetization" but it is "time and temperature dependent." (Western Digital Op. Br. at 21.) Western Digital also asserts that "how to measure Hm(α) from saturation to -0.5 magnetization is not standard in the industry. Thus, without clear and specific instructions, such measurements would produce widely different outcomes." (Id. at 22.)

b. Analysis

Western Digital does not carry its burden of showing by clear and convincing evidence that the term is indefinite in light of a POSITA's understanding of the plain meaning. Even accepting that "the reduction of magnetization is time and temperature dependent," it is no barrier for a POSITA. As Dr. Re states, "A POSITA would understand that determining whether Hm(α=20°)<Hm(α=45°) should reflect normal operating conditions. . . . The temperature should be around room temperature given that computer hard drives implementing the claimed recording medium are typically used in indoor environments." (Re Decl. ¶ 9.) That the claim language does not specifically disclose every testing parameter does not render the claims indefinite. See BASF Corp. v. Johnson Matthey Inc., 875 F.3d 1360, 1366 (Fed. Cir. 2017) ("an inventor need not explain every detail because a patent is read by those skilled in the art").

For the foregoing reasons, the Court finds that Disputed Claim Term 6 "wherein Hm(α) is a field to reduce a normalized magnetization from a saturation to -0.5" requires no construction.

7. Disputed Term 7: "a thin exchange coupling layer"

MR Tech's Proposed Construction	Western Digital's Proposed Construction
"A layer that is sufficiently thin to alter but not prevent exchange coupling between adjacent ferromagnetic layers"	Indefinite

a. The Positions of the Parties

MR Tech argues that a POSITA "understood that the 'thin exchange coupling layer' . . . is sufficiently thin to allow the magnetic moments of adjacent layers to interact." (MR Tech Op. Br. at 28.) MR Tech disputes that "thin" is a relative term and points to statements by Dr. Bertero in which he "used the synonymous term 'thin exchange break layer' to describe a purported shift in the industry" and Dr. Re in which he explained that a POSITA would determine that the thin exchange coupling layers "are

sufficiently thin to control (by reducing but not preventing) the exchange coupling between adjacent layers." (Id. at 29.) MR Tech also points out that "the Examiner raised an indefiniteness rejection as to a different term," but not to "thin" or "thin exchange coupling layer." (Id.)

Western Digital argues that "a thin exchange coupling layer" is indefinite because it neither has an "ordinary meaning in the field" nor is it defined in the '997 Patent. (Western Digital Op. Br. at 23.) Western Digital asserts that the diagram and written description both lack "guidance on either the purpose or thickness of any such coupling layer in the nucleation host." (Id.) Western Digital contends that MR Tech's proposed definition based on the thin exchange coupling layer's purpose is "not inherent in the claim language, nor is it described in the specification." (Id. at 24.)

MR Tech argues that Dr. Bertero understood "that an exchange coupling layer is a layer that reduces the exchange coupling between adjacent layers" and a "[a] POSITA thus understood that a 'thin' exchange coupling layer is simply an exchange coupling layer that is sufficiently thin to reduce but not prevent this exchange coupling." (MR Tech Resp. Br. at 18.) MR Tech argues against indefiniteness by contending that a descriptive rather than numerical boundary suffices, particularly that the "whether an exchange coupling layer is sufficiently thin to alter but not prevent exchange coupling between adjacent ferromagnetic layers would depend on its magnetic properties as well as the magnetic properties of the adjacent layers." (Id. at 20.) MR Tech also asserts that Western Digital's arguments are directed at layer 22, which "is not the claimed 'thin exchange coupling layer.'"

Western Digital responds that there are no upper or lower bounds to "thin." (Western Digital Resp. Br. at 18.) Western Digital argues that because an exchange coupling layer "by definition, is a layer that 'alters but [does] not prevent exchange coupling," then the "requirement that the 'thin' coupling layer 'not prevent' exchange coupling leaves room for 'normal' or 'thick' coupling layers." (Id.) Western Digital also refutes MR Tech's assertion that the Examiner did not object to "thin," asserting that regarding the claim element "wherein at least two of the ferromagnetic layers are exchange coupled with a thin coupling layer," the Examiner stated that "'large' and 'thin' in Claim 1 are relative terms which render the claim indefinite." (Id. at 20.)

b. Analysis

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The dispute primarily focuses on the use of the word "thin." MR Tech's construction rests on the notion that "a thin exchange coupling layer" is one that "reduces but does not prevent exchange coupling between layers." Western Digital asserts indefiniteness, but this argument is undermined by the understanding of both Dr. Re and Dr. Bertero in using the term "thin exchange coupling layer" or the related "thin exchange break layer." Given the definition of an exchange coupling layer, which reduces exchange coupling, such a layer could entirely break exchange coupling if it were thick enough. Thus, MR Tech's construction clarifies the term by conveying its role—the thinness of an exchange coupling layer is a matter of function. "A POSITA would thus understand that the 'thin exchange coupling layer' alters but maintains exchange coupling between adjacent ferromagnetic layers—i.e., that it is sufficiently thin to allow the magnetic moments of adjacent layers to interact such that they generally align in the same direction when a write field is applied to the recording medium." (Re Decl. ¶ 17.)

For the foregoing reasons, the Court construes Disputed Claim Term 7 as follows: "a layer that is sufficiently thin to alter but not prevent exchange coupling between adjacent ferromagnetic layers."

8. Disputed Term 8: "domain wall"

MR Tech's Proposed Construction	Western Digital's Proposed Construction
The domain wall is the region over which magnetic moments of the material are changing from one direction to another in response to a magnetic field	The domain wall is the region over which magnetic moments of the material are progressively changing from one easy direction to another easy direction in response to a magnetic field

a. The Positions of the Parties

MR Tech argues that its construction "reflects a POSITA's understanding in view of the claim language and the specification, and is consistent with the plain meaning." (MR Tech Op. Br. at 26.) Specifically, MR Tech points to the claim's recitation that "the

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nucleation host is coupled to the hard magnetic storage layer by an exchange coupling layer to provide an exchange coupling sufficiently strong to enable a formation of a domain wall across an interface of the hard magnetic storage layer and the nucleation host during reversal." (Id.) MR Tech contends that the "progressively" limitation that Western Digital seeks to import is unclear and "excludes a domain wall between two layers that are separated by an exchange break layer," but the claim "expressly recites that the domain wall forms across an exchange break layer—an exchange coupling layer is an exchange break layer." (Id. at 27.)

Western Digital argues that "not all instances where a 'region over which magnetic moments of the material are changing from one direction to another in response to a magnetic field' . . . would be understood to be a 'domain wall.'" (Western Digital Op. Br. at 27.) Western Digital asserts that, according to Dr. Bertero, "[t]here are various types of domain walls," and "[a] person of skill in the art would understand that a domain wall is a region over which the magnetic moments are *progressively* changing—this is what distinguishes domain wall switching from coherent switching." (Id. at 26.)

MR Tech responds that Western Digital's construction "contradicts the claim language and specification" because "there is no limitation specifying whether switching must be coherent or incoherent" and "the claim itself recites that the domain wall forms across an exchange break layer between the nucleation host and the hard storage layer." (MR Tech Resp. Br. at 24.)

Western Digital argues that MR Tech's construction "ignores the difference between coherent switching (no domain wall) and incoherent switching (domain wall)." (Western Digital Resp. Br. at 20.) Western Digital asserts that MR Tech's patent citations "describe only what a domain wall does, not what it is," and that "coherent switching without a domain wall is explicitly excluded by the claim language." (Id. at 21.) Western Digital does not dispute "a domain wall between two layers that are separated by an exchange break layer." (Id.)

b. Analysis

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The addition of the word "progressively" into the construction opens the door to confusion between multi-layer and single-layer embodiments, and it is potentially contrary to the patent. The "progressively" limitation would exclude the domain wall formation across an exchange break layer. The Court will not read in a limitation that seemingly contradicts the specification: "[t]he exchange coupling between hard magnetic storage layer 24 and nucleation host 21 can be sufficiently strong to enable the formation of a domain wall across the interface of these layers during reversal." ('864 Patent at 5:12–16.) Moreover, "progressively" could inaccurately and confusingly convey to a jury that anisotropy is always increasing, which the Court rejected above.

For the foregoing reasons, the Court construes Disputed Claim Term 8 as follows: "The domain wall is the region over which magnetic moments of the material are changing from one direction to another in response to a magnetic field."

9. Disputed Term 9: "the recording medium is usable for at least one of perpendicular recording or recording on patterned element"

MR Tech's Proposed Construction	Western Digital's Proposed Construction
Plain meaning – the recording medium is capable of being used as either perpendicular recording media or bit patterned media	Indefinite

a. The Positions of the Parties

Western Digital argues that "[n]either the claim nor the written description provide any guidance for determining whether a recording medium is 'usable' for a particular type of recording." (Western Digital Op. Br. at 30.) Western Digital asserts, through Dr. Bertero, that "media used for perpendicular recording differs significantly from media used for recording on patterned elements. (Id.) Western Digital contends that the term is indefinite because it "does not teach how the structure claims would be used or optimized in each case or why it would even be advantageous for bit patterned media."

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(Id.) Western Digital also takes issue with the term "usable" for "perpendicular recording" or "recording on patterned elements" because it is highly subjective, as a POSITA would understand usability "for a specific purpose includes a determination of the error rate of the medium when used for that purpose." (Id.) Thus, Western Digital argues that the claim term is indefinite because it fails to inform of "the scope of the invention with reasonable certainty and would require undue experimentation." (Id.)

MR Tech argues that its construction reflects the plain meaning of "usable": "capable of being used." (MR Tech Resp. Br. at 25.) MR Tech asserts that "the specification explains that embodiments of the invention are 'potential candidate[s] for patterned media since the switching field distribution due to an easy axis distribution is reduced.'" (Id.) MR Tech argues that the term is not indefinite as Western Digital alleges, and Western Digital "largely relies on written description and/or enablement defenses, which do not remotely suggest the term cannot be understood." (Id.) Moreover, MR Tech contends that "usable" is not subjective because "there is no dispute the accused products use perpendicular magnetic recording (PMR) media" and "MR Tech does not allege any recording media in this case is usable for 'recording on patterned elements.'" (Id.)

b. Analysis

As noted above, in order to meet the "definiteness" requirement, "a patent's claims, viewed in light of the specification and prosecution history, [must] inform those skilled in the art about the scope of the invention with reasonable certainty." Nautilus I, 572 U.S. at 910. The party alleging indefiniteness must prove invalidity by clear and convincing evidence. See Nautilus II, 783 F.3d at 1377. The Court concludes that Western Digital has not met its burden

Western Digital does not show by clear and convincing evidence that the term, "the recording medium is usable for at least one of perpendicular recording or recording on patterned element," is indefinite. Western Digital argues that the patent "does not teach how the structure claims would be used or optimized in each case or why it would even be advantageous for bit patterned media." While not a focus of the patent, the specification does not skip over at least some discussion of the reason for its use for patterned media: "[t]his makes exchange spring media also a potential candidate for patterned media since the switching field distribution due to an easy axis distribution is

reduced." ('864 Patent at 3:44–46.) To ignore this would be to exclude an embodiment. Still, this case, as MR Tech points out, relates to perpendicular magnetic recording media.

MR Tech, in its reply brief,[2] proposes a "plain meaning" construction that essentially replaces "usable" with the synonymous "capable of being used." The claim term is commonly used in the industry, is not ambiguous, and does not require any construction for a POSITA to know what it means. See Phillips, 415 F.3d at 1314 ("In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges."). Thus, claim construction for this term "involves little more than the application of the widely accepted meaning of commonly understood words." Id. The term "usable" is not one likely to be misunderstood by a jury, or construed differently by a POSITA, such that construction of that word is necessary—especially one that adds no additional information or clarity like "capable of being used." The minor adjustments of MR Tech's construction, however, such as the clarification of "media" rather than "element" and the use of "either" rather than "usable for at least one of" make the disputed term far more clear and understandable for a future jury.

For the foregoing reasons, the Court construes Disputed Claim Term 9 as follows: "the recording medium is capable of being used as either perpendicular recording media or bit patterned media."

IV. CONCLUSION

For the foregoing reasons, the Court construes the disputed claim terms as follows:

No.	Term	Court's Construction

[2] MR Tech did not brief this term in its opening brief.

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1.	"nucleation host . . . comprises ferromagnetic layers with increasing anisotropy constant K from layer to layer"	"Nucleation host includes two or more ferromagnetic layers which have anisotropy constants K, and the values of the anisotropy constants K for the layers increase as the layers get closer to the hard magnetic storage layer, such that the nucleation host has an overall increase in anisotropy toward the hard magnetic storage layer."
2.	"ferromagnetic layers"	"Layers with a net magnetic moment Ms greater than zero in the absence of an applied magnetic field"
3.	"nucleation host"	"A structure that includes ferromagnetic layers that assist in switching the hard magnetic storage layer, and optional coupling layers"
4.	"hard magnetic storage layer"	"A magnetic layer that stores information in magnetically oriented bits"
5.	"underlayer"	"One or more layers on which the hard magnetic storage layer is formed"
6.	"wherein Hm(α) is a field to reduce a normalized magnetization from a saturation to -0.5"	No construction necessary.
7.	"a thin exchange coupling layer"	"A layer that is sufficiently thin to alter but not prevent exchange coupling between adjacent ferromagnetic layers"
8.	"domain wall"	"The domain wall is the region over which magnetic moments of the material are changing from one direction to another in response to a magnetic field"

9.	"the recording medium is usable for at least one of perpendicular recording or recording on patterned element"	"The recording medium is capable of being used as either perpendicular recording media or bit patterned media"

IT IS SO ORDERED.

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