FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 1

This worksheet is used in the **2016 Functional Language Workshop** to facilitate the discussion of the interpretation and definiteness under 35 U.S.C. 112(b) of hypothetical product claims reciting functional language. As every claim must be examined individually based on the particular elements recited therein, a separate worksheet should be used to analyze each claim. The use of this worksheet during examination is optional.

Note: This answer key includes answers to the questions on the worksheet, as well as additional explanations drawn from the MPEP and recent training. Although examiners should be familiar with the recent training prior to participating in this workshop, pertinent resources are referenced herein so that examiners can obtain more information if needed.

Example: Laundry Detergent **Claim:** 1

1. A laundry detergent composition comprising:
a) a cleaning adjunct selected from the group consisting of a bleach, a fragrance, and a surfactant; and
b) a variant alpha-amylase enzyme having an amino acid sequence that has at least 90% identity to SEQ ID NO: 6,
wherein the laundry detergent composition has increased thermostability at high temperatures relative to BSG.

Part I: Identifying Functional Language

As a first step, functional limitations in the claim should be identified. A claim limitation is functional when it recites a feature by *what it does* rather than by *what it is*. Claims often use functional language to add further description to some structure or action, for example how elements or steps tie together, or to provide context to claim elements. Functional language can appear in limitations that invoke 35 U.S.C. 112(f) ("means-plus-function"), and in limitations that do not invoke § 112(f). Limitations that do not invoke § 112(f) are typically recited with some structure, material or action to define a particular capability or purpose served by the recited structure, material or action. For more information, refer to MPEP 2111 and 2181, and the following training modules: *Broadest Reasonable Interpretation (BRI) and the Plain Meaning of Claim Terms*; *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; *35 U.S.C. 112(f): Identifying Limitations That Invoke 112(f)*; and *35 U.S.C. § 112(f): Making the Record Clear*.

This claim includes at least one instance of functional language, which is:

"the laundry detergent composition has increased thermostability at high temperatures relative to BSG"

Note: This phrase will be the focus of this workshop. However, notice that these claims recite other instances of functional language, such as the enzyme being an "alpha-amylase", *i.e.*, the enzyme has the functional characteristic of alpha-amylase

activity. The meaning of this phrase and any limits imposed by this language would be clear when the claim is given its broadest reasonable interpretation, because one of ordinary skill in this art would know what amino acid sequences make the enzyme have alpha-amylase activity (an enzyme's functional characteristics are a natural consequence of its structure/amino acid sequence).

1. Does the claim element including this functional language invoke 35 U.S.C. 112(f)?

Use the three-prong analysis in MPEP 2181 to determine whether the claim limitation invokes § 112(f).

Yes	No	Notes
☐	☒	Prong A is met because: n/a; the language does not recite "means" or a generic placeholder for "means". Prong B is met because: n/a Prong C is met because: n/a

Part II: Construing Functional Language

During examination, claims are given their broadest reasonable interpretation (BRI) in light of the specification as it would be interpreted by one of ordinary skill in the art. It is a best practice to make the record clear during prosecution by explaining the BRI of claim terms, as necessary, including explaining the BRI of any functional language. When § 112(f) is invoked, the BRI of the "means-plus-function" limitation is restricted to the corresponding structure in the supporting disclosure, and its equivalents (the corresponding specification that identifies and links the structure, material or act to the function recited in the claim is considered to be part of the claim limitation). When § 112(f) is not invoked and an element is recited along with a function, that element is construed as being capable of performing the function – in other words, the BRI of that element is limited by the function.

It should be kept in mind, however, that there is a distinction between reciting a function compared to reciting an intended use or result. A functional limitation can provide a patentable distinction (limit the claim scope) by imposing limits on the function of a structure, material or action. Typically no patentable distinction (no limit on the claim scope) is made by an intended use or result unless some structural difference is imposed by the use or result on the structure or material recited in the claim, or some manipulative difference is imposed by the use or result on the action recited in the claim.

For more information, refer to MPEP 2111 and 2181, and the following training modules: *Broadest Reasonable Interpretation (BRI) and the Plain Meaning of Claim Terms*; *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; and *35 U.S.C. 112(f): Broadest Reasonable Interpretation and Definiteness of § 112(f) Limitations*.

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY

LAUNDRY DETERGENT: CLAIM 1

2. What is the broadest reasonable interpretation (BRI) of the functional language? Answer part A if the functional language does not invoke § 112(f), and Part B if the functional language is part of a § 112(f) limitation.

A. BRI if § 112(f) is <u>not</u> invoked
The structure, material or act in the claim that is connected to (*i.e*., performs) the recited function is: n/a; the claimed functional characteristic of increased thermostability is not provided by any structure recited in the claim. The BRI of the functional language is: that the composition must somehow be provided with increased thermostability at high temperatures (which the specification defines as 80 to 100 °C) relative to BSG.

B. BRI if § 112(f) is invoked
The corresponding structure, material or act in the specification that performs the recited function is: The BRI of the § 112(f) limitation is:

3. Does the functional language limit the claim scope (*i.e.*, must a prior art reference disclose this functional limitation in order to anticipate the claim)?

Yes	**No**	**Notes**
☒	☐	The reason why the functional language does (or does not) limit the claim scope is: it imposes a requirement for increased thermostability on the detergent; thus, anticipatory detergents must have the functional characteristic of increased thermostability at high temperatures relative to BSG.

Part III: Definiteness of Functional Language

While functional limitations may be properly used in claims, the boundaries imposed by a functional limitation must be clearly defined to be definite under 35 U.S.C. 112(b). Claim language that merely states a result to be obtained without providing boundaries on the claim scope (*e.g.*, by not specifying any way to achieve those results) is unclear. Consider the following to determine whether a claim limitation expressed in functional language has clear boundaries: whether one of ordinary skill in the art can determine what structure, material or act in the claim performs this function; whether the limitation has well defined boundaries or only expresses a problem solved or intended result; and what an anticipatory reference would need to disclose in order to satisfy this claim limitation. These considerations are not all-inclusive or limiting.

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 1

When § 112(f) is invoked, the specification must adequately disclose a corresponding structure, material or act that performs the function. For "means"-type claims, an adequate disclosure requires that the corresponding structure or material is: (a) disclosed in a way that one of ordinary skill in the art will understand what specific structure or material the inventor has identified to perform the recited function; (b) sufficient to perform the entire function recited in the claim limitation; and (c) clearly linked to the function in the written description.

When the examiner determines that the boundaries of a claim are not reasonably clear, a rejection under § 112(b) should be made. Such a rejection puts the applicant on notice that it must fulfill its statutory duty under § 112(b) to ensure that claim language clearly defines the boundaries of the claim scope sought. In making a rejection, the examiner must identify the specific claim language that is indefinite, and explain why that language renders the boundaries of the claim unclear. When possible, the examiner should suggest how the indefiniteness issues may be resolved.

For more information, refer to MPEP 2173.02, 2173.05(g), 2181 and 2182, and the following training modules*: Enhancing Clarity By Ensuring That Claims Are Definite Under 35 U.S.C. 112(b)*; *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; *35 U.S.C. 112(f): Broadest Reasonable Interpretation and Definiteness of § 112(f) Limitations*; and *35 U.S.C. 112(f): Evaluating § 112(f) Limitations in Software-Related Claims for Definiteness under 35 USC 112(b)*.

For § 112(f) limitations:

4. If the functional language is part of a "means"-type § 112(f) limitation, answer the following questions about the corresponding structure or material. Otherwise, skip to Question 5.

A) Does the specification disclose or describe a structure or material as performing the claimed function?

Yes	No	Notes
☐	☐	The corresponding structure or material is:

B) Is the disclosed or described structure or material sufficient to perform the entire claimed function?

Yes	No	Notes
☐	☐	The reason is:

C) Does the specification clearly link the structure or material to the claimed function?

Yes	No	Notes
☐	☐	The reason is:

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 1

For functional language that does not invoke § 112(f):

5. Are the boundaries of the functional language clear, *i.e.*, can one of ordinary skill in the art draw the boundary between what is covered by the claim and what is not covered?

Yes	No	Notes
☐	☒	The boundaries of the functional language are: unclear because the claim does not provide a discernable boundary on what provides the functional characteristic to the composition. As explained in the specification, most of the variant enzymes do ***not*** exhibit increased thermostability, and thus the recited functional characteristic does not follow from (is not an inherent property of) the structure recited in the claim, *i.e.,* the cleaning adjunct and the variant enzyme having 90% identity to SEQ ID NO: 6. As a result, although it is known in the art that there are multiple ways to provide increased thermostability to an enzyme-based laundry detergent composition, it is unclear ***which*** of those ways are encompassed by the claim. *E.g.*, is a composition that has the functional characteristic (increased thermostability) due to the addition of some other structure (such as a stabilizer molecule or a pH modifier) encompassed by this claim? Or is the claim limited to compositions that have the functional characteristic due to a change in the enzyme's sequence? Thus, one of ordinary skill in the art would not be able to draw a clear boundary between what is and is not covered by the claim. See MPEP 2173.05(g) for more information.

Following Question 4 or 5, for § 112(f) limitations <u>and</u> limitations that do not invoke § 112(f):

6. Should the claim be rejected as indefinite under 35 U.S.C. 112(b)?

Yes	No	Notes
☒	☐	A sample rejection under 35 U.S.C. 112(b): [FP 7.34.01] Claim 1 is rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant, regards as the invention.

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 1

Yes	No	Notes
		The indefinite claim language is: "the laundry detergent composition has increased thermostability at high temperatures relative to BSG". This limitation is unclear because: this limitation merely states a functional characteristic (increased thermostability) without providing any indication about how the functional characteristic is provided. The recited functional characteristic does not follow from (is not an inherent property of) the structure recited in the claim, *i.e.,* the cleaning adjunct and the variant enzyme having 90% identity to SEQ ID NO: 6, so it is unclear whether the claim requires some other structure to be added to the composition, such as a stabilizer molecule or a pH modifier, to provide the functional characteristic. A suggestion for how applicant could resolve the unclear boundaries is: amending the claim to specify how the thermostability is increased, provided such an amendment is supported by the specification. For example, the amendment could specify the particular sequence modification to the enzyme that increases the thermostability, or could even just specify that the increase in thermostability is accomplished through sequence modification. Each of these amendments when interpreted in view of the specification would inform one of ordinary skill in the art of the metes and bounds of the functional limitation. *Note:* Claims 2-5 in this exercise show variations of this functional phrase used in ways that do not raise any issues of indefiniteness because any limits imposed by the phrase have clearly defined boundaries.

Part IV: Addressing Functional Language

Examiners should keep in mind that, under the principles of compact prosecution, each claim should be examined for compliance with every statutory requirement for patentability in the initial review of the application. Thus, when the examiner determines that a claim term or phrase renders the claim indefinite, the examiner should make a rejection based on indefiniteness under 35 U.S.C.

112(b), as well as any other applicable rejection (*e.g.*, under 35 U.S.C. §§ 101, 102, 103, and/or 112).

When functional claim language is found indefinite, it typically lacks an adequate written description under § 112(a), because an indefinite, unbounded functional limitation would cover all ways of performing a function and indicate that the inventor has not provided sufficient disclosure to show possession of the invention. Thus, in most cases, a § 112(b) rejection that is based on functional language having unclear (or no) claim boundaries should be accompanied by a rejection under § 112(a) based on failure to provide a written description for the claim.

Because functional claim language that is not limited to a specific structure covers all devices that are capable of performing the recited function or all materials that have the functional characteristic, a rejection under §§ 102 or 103 may be appropriate if the prior art discloses a device that can inherently perform the claimed function or a material that inherently has the functional characteristic. When making a rejection, it is important that the examiner state on the record how the functional claim term or phrase is being interpreted with respect to the prior art applied in the rejection.

For more information, refer to MPEP 2173.05(g), 2182, and 2183, and the following training modules: *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; and *35 U.S.C. 112(f): Broadest Reasonable Interpretation and Definiteness of § 112(f) Limitations*.

Group Discussion:

Assume that prior art reference X was published by another several years prior to applicant's earliest filing date (*i.e.*, X qualifies as prior art under § 102) and teaches elements that meet all the structural elements recited in this claim.

Using the BRI of this claim taking into account any limits imposed by the functional language, what prior art rejections would be appropriate? Consider scenarios where X explicitly discloses the recited function or where the structure in X performs the function with the same means, an equivalent means or a different means. If the claim has been found indefinite, assume that the best possible understanding of the claim is being used in the prior art rejection for purposes of compact prosecution.

> Discussion points: In this case, the functional language imposes an additional limit on the claim, but the boundaries are unknown. If X's composition is provided with the functional characteristic in a different way than applicant's preferred embodiment (*e.g.*, by adding a stabilizer molecule or adjusting the pH of the detergent composition), it can still anticipate claim 1 because claim 1 has no limits on how the function is accomplished.
>
> If X is silent as to the functional characteristic, it cannot anticipate claim 1, unless it can be shown that the increased thermostability is an inherent property of X's disclosed laundry detergent composition. For example, if X teaches an enzyme with a deletion modification at a particular amino acid position, such a modification may inherently result in an increased thermostability because an enzyme's functional characteristics are a natural consequence of its structure/amino acid sequence.

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 2

This worksheet is used in the **2016 Functional Language Workshop** to facilitate the discussion of the interpretation and definiteness under 35 U.S.C. 112(b) of hypothetical product claims reciting functional language. As every claim must be examined individually based on the particular elements recited therein, a separate worksheet should be used to analyze each claim. The use of this worksheet during examination is optional.

Note: This answer key includes answers to the questions on the worksheet, as well as additional explanations drawn from the MPEP and recent training. Although examiners should be familiar with the recent training prior to participating in this workshop, pertinent resources are referenced herein so that examiners can obtain more information if needed.

Example: Laundry Detergent **Claim:** 2

2. A laundry detergent composition comprising:
a) a cleaning adjunct selected from the group consisting of a bleach, a fragrance, and a surfactant; and
b) a variant alpha-amylase enzyme having
(i) an amino acid sequence that has at least 90% identity to SEQ ID NO: 6, and
(ii) one or more substitution modifications at positions corresponding to positions 50, 61 and 105 of SEQ ID NO: 6,
wherein the laundry detergent composition has increased thermostability at high temperatures relative to BSG.

Part I: Identifying Functional Language

As a first step, functional limitations in the claim should be identified. A claim limitation is functional when it recites a feature by *what it does* rather than by *what it is*. Claims often use functional language to add further description to some structure or action, for example how elements or steps tie together, or to provide context to claim elements. Functional language can appear in limitations that invoke 35 U.S.C. 112(f) ("means-plus-function"), and in limitations that do not invoke § 112(f). Limitations that do not invoke § 112(f) are typically recited with some structure, material or action to define a particular capability or purpose served by the recited structure, material or action. For more information, refer to MPEP 2111 and 2181, and the following training modules: *Broadest Reasonable Interpretation (BRI) and the Plain Meaning of Claim Terms*; *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; *35 U.S.C. 112(f): Identifying Limitations That Invoke 112(f)*; and *35 U.S.C. § 112(f): Making the Record Clear*.

This claim includes at least one instance of functional language, which is:

"the laundry detergent composition has increased thermostability at high temperatures relative to BSG"

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 2

1. Does the claim element including this functional language invoke 35 U.S.C. 112(f)?

Use the three-prong analysis in MPEP 2181 to determine whether the claim limitation invokes § 112(f).

Yes	No	Notes
☐	☒	Prong A is met because: n/a; the language does not recite "means" or a generic placeholder for "means". Prong B is met because: n/a Prong C is met because: n/a

Part II: Construing Functional Language

During examination, claims are given their broadest reasonable interpretation (BRI) in light of the specification as it would be interpreted by one of ordinary skill in the art. It is a best practice to make the record clear during prosecution by explaining the BRI of claim terms, as necessary, including explaining the BRI of any functional language. When § 112(f) is invoked, the BRI of the "means-plus-function" limitation is restricted to the corresponding structure in the supporting disclosure, and its equivalents (the corresponding specification that identifies and links the structure, material or act to the function recited in the claim is considered to be part of the claim limitation). When § 112(f) is not invoked and an element is recited along with a function, that element is construed as being capable of performing the function – in other words, the BRI of that element is limited by the function.

It should be kept in mind, however, that there is a distinction between reciting a function compared to reciting an intended use or result. A functional limitation can provide a patentable distinction (limit the claim scope) by imposing limits on the function of a structure, material or action. Typically no patentable distinction (no limit on the claim scope) is made by an intended use or result unless some structural difference is imposed by the use or result on the structure or material recited in the claim, or some manipulative difference is imposed by the use or result on the action recited in the claim.

For more information, refer to MPEP 2111 and 2181, and the following training modules: *Broadest Reasonable Interpretation (BRI) and the Plain Meaning of Claim Terms*; *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; and *35 U.S.C. 112(f): Broadest Reasonable Interpretation and Definiteness of § 112(f) Limitations*.

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 2

2. What is the broadest reasonable interpretation (BRI) of the functional language? Answer part A if the functional language does not invoke § 112(f), and Part B if the functional language is part of a § 112(f) limitation.

A. BRI if § 112(f) is <u>not</u> invoked
The structure, material or act in the claim that is connected to (*i.e.*, performs) the recited function is: the specific substitution modifications in element (b)(ii), *i.e.*, the enzyme's amino acid sequence has one or more substitution modifications at positions corresponding to positions 50, 61 and 105 of SEQ ID NO: 6. These specific modifications achieve the result (a laundry detergent composition having increased thermostability at high temperatures, which the specification defines as 80 to 100 °C). The BRI of the functional language is: an intended result of the specific substitution modifications.

B. BRI if § 112(f) is invoked
The corresponding structure, material or act in the specification that performs the recited function is: The BRI of the § 112(f) limitation is:

3. Does the functional language limit the claim scope (*i.e.*, must a prior art reference disclose this functional limitation in order to anticipate the claim)?

Yes	**No**	**Notes**
☐	☒	The reason why the functional language does (or does not) limit the claim scope is: because one of ordinary skill in the art would understand that the structure already recited in the claim, *e.g.*, an enzyme having the specific substitution modifications of element (b)(ii), achieves the intended result of increased thermostability.

Part III: Definiteness of Functional Language

While functional limitations may be properly used in claims, the boundaries imposed by a functional limitation must be clearly defined to be definite under 35 U.S.C. 112(b). Claim language that merely states a result to be obtained without providing boundaries on the claim scope (*e.g.*, by not specifying any way to achieve those results) is unclear. Consider the following to determine whether a claim limitation expressed in functional language has clear boundaries: whether one of ordinary skill in the art can determine what structure, material or act in the claim performs this

function; whether the limitation has well defined boundaries or only expresses a problem solved or intended result; and what an anticipatory reference would need to disclose in order to satisfy this claim limitation. These considerations are not all-inclusive or limiting.

When § 112(f) is invoked, the specification must adequately disclose a corresponding structure, material or act that performs the function. For "means"-type claims, an adequate disclosure requires that the corresponding structure or material is: (a) disclosed in a way that one of ordinary skill in the art will understand what specific structure or material the inventor has identified to perform the recited function; (b) sufficient to perform the entire function recited in the claim limitation; and (c) clearly linked to the function in the written description.

When the examiner determines that the boundaries of a claim are not reasonably clear, a rejection under § 112(b) should be made. Such a rejection puts the applicant on notice that it must fulfill its statutory duty under § 112(b) to ensure that claim language clearly defines the boundaries of the claim scope sought. In making a rejection, the examiner must identify the specific claim language that is indefinite, and explain why that language renders the boundaries of the claim unclear. When possible, the examiner should suggest how the indefiniteness issues may be resolved.

For more information, refer to MPEP 2173.02, 2173.05(g), 2181 and 2182, and the following training modules*: Enhancing Clarity By Ensuring That Claims Are Definite Under 35 U.S.C. 112(b)*; *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; *35 U.S.C. 112(f): Broadest Reasonable Interpretation and Definiteness of § 112(f) Limitations*; and *35 U.S.C. 112(f): Evaluating § 112(f) Limitations in Software-Related Claims for Definiteness under 35 USC 112(b)*.

For § 112(f) limitations:

4. If the functional language is part of a "means"-type § 112(f) limitation, answer the following questions about the corresponding structure or material. Otherwise, skip to Question 5.

A) Does the specification disclose or describe a structure or material as performing the claimed function?

Yes	No	Notes
☐	☐	The corresponding structure or material is:

B) Is the disclosed or described structure or material sufficient to perform the entire claimed function?

Yes	No	Notes
☐	☐	The reason is:

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 2

C) Does the specification clearly link the structure or material to the claimed function?

Yes	No	Notes
☐	☐	The reason is:

For functional language that does not invoke § 112(f):

5. Are the boundaries of the functional language clear, *i.e.*, can one of ordinary skill in the art draw the boundary between what is covered by the claim and what is not covered?

Yes	No	Notes
☒	☐	The boundaries of the functional language are: clear. Because this functional language merely recites the intended result of the recited structural limitations, it imposes no patentable distinction on the claim (is not limiting). One of ordinary skill in the art would understand that detergent compositions comprising an enzyme with the same structure as that recited in the claim (*e.g.*, an enzyme having an amino acid sequence that has at least 90% identity to SEQ ID NO: 6 and has the specific substitution modifications of element (b)(ii)) will achieve the intended result and fall within the boundaries of the claim.

Following Question 4 or 5, for § 112(f) limitations <u>and</u> limitations that do not invoke § 112(f):

6. Should the claim be rejected as indefinite under 35 U.S.C. 112(b)?

Yes	No	Notes
☐	☒	The indefinite claim language is: This limitation is unclear because: A suggestion for how applicant could resolve the unclear boundaries is:

Part IV: Addressing Functional Language

Examiners should keep in mind that, under the principles of compact prosecution, each claim should be examined for compliance with every statutory requirement for patentability in the initial

review of the application. Thus, when the examiner determines that a claim term or phrase renders the claim indefinite, the examiner should make a rejection based on indefiniteness under 35 U.S.C. 112(b), as well as any other applicable rejection (*e.g.*, under 35 U.S.C. §§ 101, 102, 103, and/or 112).

When functional claim language is found indefinite, it typically lacks an adequate written description under § 112(a), because an indefinite, unbounded functional limitation would cover all ways of performing a function and indicate that the inventor has not provided sufficient disclosure to show possession of the invention. Thus, in most cases, a § 112(b) rejection that is based on functional language having unclear (or no) claim boundaries should be accompanied by a rejection under § 112(a) based on failure to provide a written description for the claim.

Because functional claim language that is not limited to a specific structure covers all devices that are capable of performing the recited function or all materials that have the functional characteristic, a rejection under §§ 102 or 103 may be appropriate if the prior art discloses a device that can inherently perform the claimed function or a material that inherently has the functional characteristic. When making a rejection, it is important that the examiner state on the record how the functional claim term or phrase is being interpreted with respect to the prior art applied in the rejection.

For more information, refer to MPEP 2173.05(g), 2182, and 2183, and the following training modules: *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; and *35 U.S.C. 112(f): Broadest Reasonable Interpretation and Definiteness of § 112(f) Limitations*.

Group Discussion:

Assume that prior art reference X was published by another several years prior to applicant's earliest filing date (*i.e.*, X qualifies as prior art under § 102) and teaches elements that meet all the structural elements recited in this claim.

Using the BRI of this claim taking into account any limits imposed by the functional language, what prior art rejections would be appropriate? Consider scenarios where X explicitly discloses the recited function or where the structure in X performs the function with the same means, an equivalent means or a different means. If the claim has been found indefinite, assume that the best possible understanding of the claim is being used in the prior art rejection for purposes of compact prosecution.

> Discussion points: In this case, the functional language does not further limit the claim because the structure that provides the functional characteristic is also recited in the claim. So, since X meets all of the structural limitations, it anticipates claim 2 regardless of whether the functional characteristic is explicitly disclosed by X.

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 3

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Note: This answer key includes answers to the questions on the worksheet, as well as additional explanations drawn from the MPEP and recent training. Although examiners should be familiar with the recent training prior to participating in this workshop, pertinent resources are referenced herein so that examiners can obtain more information if needed.

Example: Laundry Detergent **Claim:** 3

3. A laundry detergent composition ***for increased thermostability during high-temperature washes*** comprising:
a) a cleaning adjunct selected from the group consisting of a bleach, a fragrance, and a surfactant; and
b) a variant alpha-amylase enzyme having
(i) an amino acid sequence that has at least 90% identity to SEQ ID NO: 6, and
(ii) one or more substitution modifications at positions corresponding to positions 50, 61 and 105 of SEQ ID NO: 6.

Part I: Identifying Functional Language

As a first step, functional limitations in the claim should be identified. A claim limitation is functional when it recites a feature by *what it does* rather than by *what it is*. Claims often use functional language to add further description to some structure or action, for example how elements or steps tie together, or to provide context to claim elements. Functional language can appear in limitations that invoke 35 U.S.C. 112(f) ("means-plus-function"), and in limitations that do not invoke § 112(f). Limitations that do not invoke § 112(f) are typically recited with some structure, material or action to define a particular capability or purpose served by the recited structure, material or action. For more information, refer to MPEP 2111 and 2181, and the following training modules: *Broadest Reasonable Interpretation (BRI) and the Plain Meaning of Claim Terms*; *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; *35 U.S.C. 112(f): Identifying Limitations That Invoke 112(f)*; and *35 U.S.C. § 112(f): Making the Record Clear*.

This claim includes at least one instance of functional language, which is:

"for increased thermostability during high temperature washes", in the preamble.

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 3

1. Does the claim element including this functional language invoke 35 U.S.C. 112(f)?

Use the three-prong analysis in MPEP 2181 to determine whether the claim limitation invokes § 112(f).

Yes	No	Notes
☐	☒	Prong A is met because: n/a; the language does not recite "means" or a generic placeholder for "means". Prong B is met because: n/a Prong C is met because: n/a

Part II: Construing Functional Language

During examination, claims are given their broadest reasonable interpretation (BRI) in light of the specification as it would be interpreted by one of ordinary skill in the art. It is a best practice to make the record clear during prosecution by explaining the BRI of claim terms, as necessary, including explaining the BRI of any functional language. When § 112(f) is invoked, the BRI of the "means-plus-function" limitation is restricted to the corresponding structure in the supporting disclosure, and its equivalents (the corresponding specification that identifies and links the structure, material or act to the function recited in the claim is considered to be part of the claim limitation). When § 112(f) is not invoked and an element is recited along with a function, that element is construed as being capable of performing the function – in other words, the BRI of that element is limited by the function.

It should be kept in mind, however, that there is a distinction between reciting a function compared to reciting an intended use or result. A functional limitation can provide a patentable distinction (limit the claim scope) by imposing limits on the function of a structure, material or action. Typically no patentable distinction (no limit on the claim scope) is made by an intended use or result unless some structural difference is imposed by the use or result on the structure or material recited in the claim, or some manipulative difference is imposed by the use or result on the action recited in the claim.

For more information, refer to MPEP 2111 and 2181, and the following training modules: *Broadest Reasonable Interpretation (BRI) and the Plain Meaning of Claim Terms*; *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; and *35 U.S.C. 112(f): Broadest Reasonable Interpretation and Definiteness of § 112(f) Limitations*.

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 3

2. What is the broadest reasonable interpretation (BRI) of the functional language? Answer part A if the functional language does not invoke § 112(f), and Part B if the functional language is part of a § 112(f) limitation.

A. BRI if § 112(f) is <u>not</u> invoked
The structure, material or act in the claim that is connected to (*i.e.*, performs) the recited function is: the specific substitution modifications in element (b)(ii), *i.e.*, the enzyme's amino acid sequence has one or more substitution modifications at positions corresponding to positions 50, 61 and 105 of SEQ ID NO: 6. These specific modifications provide the functional characteristic (a laundry detergent composition having increased thermostability at high temperatures, which the specification defines as 80 to 100 °C). The BRI of the functional language is: an intended use of the laundry detergent.

B. BRI if § 112(f) is invoked
The corresponding structure, material or act in the specification that performs the recited function is: The BRI of the § 112(f) limitation is:

3. Does the functional language limit the claim scope (*i.e.*, must a prior art reference disclose this functional limitation in order to anticipate the claim)?

Yes	**No**	**Notes**
☐	☒	The reason why the functional language does (or does not) limit the claim scope is: because one of ordinary skill in the art would understand that the intended use flows from the structure recited in the body of the claim, *e.g.*, a detergent composition comprising an enzyme having the specific substitution modifications of element (b)(ii) will have increased thermostability at high temperatures. The intended use does not recite structure, or provide context for claim construction of the laundry detergent. In other words, it does not provide criteria by which the laundry detergent can be distinguished from the prior art.

Part III: Definiteness of Functional Language

While functional limitations may be properly used in claims, the boundaries imposed by a functional limitation must be clearly defined to be definite under 35 U.S.C. 112(b). Claim language that merely states a result to be obtained without providing boundaries on the claim scope (*e.g.*, by not specifying any way to achieve those results) is unclear. Consider the following to determine whether a claim limitation expressed in functional language has clear boundaries: whether one of ordinary skill in the art can determine what structure, material or act in the claim performs this function; whether the limitation has well defined boundaries or only expresses a problem solved or intended result; and what an anticipatory reference would need to disclose in order to satisfy this claim limitation. These considerations are not all-inclusive or limiting.

When § 112(f) is invoked, the specification must adequately disclose a corresponding structure, material or act that performs the function. For "means"-type claims, an adequate disclosure requires that the corresponding structure or material is: (a) disclosed in a way that one of ordinary skill in the art will understand what specific structure or material the inventor has identified to perform the recited function; (b) sufficient to perform the entire function recited in the claim limitation; and (c) clearly linked to the function in the written description.

When the examiner determines that the boundaries of a claim are not reasonably clear, a rejection under § 112(b) should be made. Such a rejection puts the applicant on notice that it must fulfill its statutory duty under § 112(b) to ensure that claim language clearly defines the boundaries of the claim scope sought. In making a rejection, the examiner must identify the specific claim language that is indefinite, and explain why that language renders the boundaries of the claim unclear. When possible, the examiner should suggest how the indefiniteness issues may be resolved.

For more information, refer to MPEP 2173.02, 2173.05(g), 2181 and 2182, and the following training modules*: Enhancing Clarity By Ensuring That Claims Are Definite Under 35 U.S.C. 112(b)*; *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; *35 U.S.C. 112(f): Broadest Reasonable Interpretation and Definiteness of § 112(f) Limitations*; and *35 U.S.C. 112(f): Evaluating § 112(f) Limitations in Software-Related Claims for Definiteness under 35 USC 112(b)*.

For § 112(f) limitations:

4. If the functional language is part of a "means"-type § 112(f) limitation, answer the following questions about the corresponding structure or material. Otherwise, skip to Question 5.

A) Does the specification disclose or describe a structure or material as performing the claimed function?

Yes	No	Notes
☐	☐	The corresponding structure or material is:

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 3

B) Is the disclosed or described structure or material sufficient to perform the entire claimed function?

Yes	No	Notes
☐	☐	The reason is:

C) Does the specification clearly link the structure or material to the claimed function?

Yes	No	Notes
☐	☐	The reason is:

For functional language that does not invoke § 112(f):

5. Are the boundaries of the functional language clear, *i.e.*, can one of ordinary skill in the art draw the boundary between what is covered by the claim and what is not covered?

Yes	No	Notes
☒	☐	The boundaries of the functional language are: clear. Because this functional language merely recites an intended use of the laundry detergent defined by the recited structural limitations, it imposes no patentable distinction on the claim (is not limiting). One of ordinary skill in the art would understand that detergent compositions comprising an enzyme with the same structure as that recited in the claim (*e.g.*, an enzyme having an amino acid sequence that has at least 90% identity to SEQ ID NO: 6 and has the specific substitution modifications of element (b)(ii)), can be used in the intended manner and will fall within the boundaries of the claim.

Following Question 4 or 5, for § 112(f) limitations <u>and</u> limitations that do not invoke § 112(f):

6. Should the claim be rejected as indefinite under 35 U.S.C. 112(b)?

Yes	No	Notes
☐	☒	The indefinite claim language is: This limitation is unclear because: A suggestion for how applicant could resolve the unclear boundaries is:

Part IV: Addressing Functional Language

Examiners should keep in mind that, under the principles of compact prosecution, each claim should be examined for compliance with every statutory requirement for patentability in the initial review of the application. Thus, when the examiner determines that a claim term or phrase renders the claim indefinite, the examiner should make a rejection based on indefiniteness under 35 U.S.C. 112(b), as well as any other applicable rejection (*e.g.*, under 35 U.S.C. §§ 101, 102, 103, and/or 112).

When functional claim language is found indefinite, it typically lacks an adequate written description under § 112(a), because an indefinite, unbounded functional limitation would cover all ways of performing a function and indicate that the inventor has not provided sufficient disclosure to show possession of the invention. Thus, in most cases, a § 112(b) rejection that is based on functional language having unclear (or no) claim boundaries should be accompanied by a rejection under § 112(a) based on failure to provide a written description for the claim.

Because functional claim language that is not limited to a specific structure covers all devices that are capable of performing the recited function or all materials that have the functional characteristic, a rejection under §§ 102 or 103 may be appropriate if the prior art discloses a device that can inherently perform the claimed function or a material that inherently has the functional characteristic. When making a rejection, it is important that the examiner state on the record how the functional claim term or phrase is being interpreted with respect to the prior art applied in the rejection.

For more information, refer to MPEP 2173.05(g), 2182, and 2183, and the following training modules: *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; and *35 U.S.C. 112(f): Broadest Reasonable Interpretation and Definiteness of § 112(f) Limitations*.

Group Discussion:

Assume that prior art reference X was published by another several years prior to applicant's earliest filing date (*i.e.*, X qualifies as prior art under § 102) and teaches elements that meet all the structural elements recited in this claim.

Using the BRI of this claim taking into account any limits imposed by the functional language, what prior art rejections would be appropriate? Consider scenarios where X explicitly discloses the recited function or where the structure in X performs the function with the same means, an equivalent means or a different means. If the claim has been found indefinite, assume that the best possible understanding of the claim is being used in the prior art rejection for purposes of compact prosecution.

> Discussion points: In this case, the functional language does not further limit the claim because the structure that provides the functional characteristic is also recited in the claim. So, since X meets all of the structural limitations, it anticipates claim 3 regardless of whether the functional characteristic is explicitly disclosed by X.

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 4

This worksheet is used in the **2016 Functional Language Workshop** to facilitate the discussion of the interpretation and definiteness under 35 U.S.C. 112(b) of hypothetical product claims reciting functional language. As every claim must be examined individually based on the particular elements recited therein, a separate worksheet should be used to analyze each claim. The use of this worksheet during examination is optional.

Note: This answer key includes answers to the questions on the worksheet, as well as additional explanations drawn from the MPEP and recent training. Although examiners should be familiar with the recent training prior to participating in this workshop, pertinent resources are referenced herein so that examiners can obtain more information if needed.

Example: Laundry Detergent **Claim:** 4

4. A laundry detergent composition comprising:
a) a cleaning adjunct selected from the group consisting of a bleach, a fragrance, and a surfactant; and
b) a variant alpha-amylase enzyme having
(i) an amino acid sequence that has at least 90% identity to SEQ ID NO: 6, and
(ii) one or more sequence modifications that ***cause the variant alpha-amylase enzyme to have increased thermostability relative to BSG***.

Part I: Identifying Functional Language

As a first step, functional limitations in the claim should be identified. A claim limitation is functional when it recites a feature by *what it does* rather than by *what it is*. Claims often use functional language to add further description to some structure or action, for example how elements or steps tie together, or to provide context to claim elements. Functional language can appear in limitations that invoke 35 U.S.C. 112(f) ("means-plus-function"), and in limitations that do not invoke § 112(f). Limitations that do not invoke § 112(f) are typically recited with some structure, material or action to define a particular capability or purpose served by the recited structure, material or action. For more information, refer to MPEP 2111 and 2181, and the following training modules: *Broadest Reasonable Interpretation (BRI) and the Plain Meaning of Claim Terms*; *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; *35 U.S.C. 112(f): Identifying Limitations That Invoke 112(f)*; and *35 U.S.C. § 112(f): Making the Record Clear*.

This claim includes at least one instance of functional language, which is:

"cause the variant alpha-amylase enzyme to have increased thermostability relative to BSG"

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 4

1. Does the claim element including this functional language invoke 35 U.S.C. 112(f)?

Use the three-prong analysis in MPEP 2181 to determine whether the claim limitation invokes § 112(f).

Yes	No	Notes
☐	☒	Prong A is met because: n/a; the language does not recite "means" or a generic placeholder for "means". Prong B is met because: n/a Prong C is met because: n/a

Part II: Construing Functional Language

During examination, claims are given their broadest reasonable interpretation (BRI) in light of the specification as it would be interpreted by one of ordinary skill in the art. It is a best practice to make the record clear during prosecution by explaining the BRI of claim terms, as necessary, including explaining the BRI of any functional language. When § 112(f) is invoked, the BRI of the "means-plus-function" limitation is restricted to the corresponding structure in the supporting disclosure, and its equivalents (the corresponding specification that identifies and links the structure, material or act to the function recited in the claim is considered to be part of the claim limitation). When § 112(f) is not invoked and an element is recited along with a function, that element is construed as being capable of performing the function – in other words, the BRI of that element is limited by the function.

It should be kept in mind, however, that there is a distinction between reciting a function compared to reciting an intended use or result. A functional limitation can provide a patentable distinction (limit the claim scope) by imposing limits on the function of a structure, material or action. Typically no patentable distinction (no limit on the claim scope) is made by an intended use or result unless some structural difference is imposed by the use or result on the structure or material recited in the claim, or some manipulative difference is imposed by the use or result on the action recited in the claim.

For more information, refer to MPEP 2111 and 2181, and the following training modules: *Broadest Reasonable Interpretation (BRI) and the Plain Meaning of Claim Terms*; *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; and *35 U.S.C. 112(f): Broadest Reasonable Interpretation and Definiteness of § 112(f) Limitations*.

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 4

2. What is the broadest reasonable interpretation (BRI) of the functional language? Answer part A if the functional language does not invoke § 112(f), and Part B if the functional language is part of a § 112(f) limitation.

A. BRI if § 112(f) is <u>not</u> invoked
The structure, material or act in the claim that is connected to (*i.e*., performs) the recited function is: the one or more sequence modifications of element (b)(ii). The BRI of the functional language is: any sequence modification or modifications that cause the variant alpha-amylase enzyme to have increased thermostability relative to BSG.

B. BRI if § 112(f) is invoked
The corresponding structure, material or act in the specification that performs the recited function is: The BRI of the § 112(f) limitation is:

3. Does the functional language limit the claim scope (*i.e.*, must a prior art reference disclose this functional limitation in order to anticipate the claim)?

Yes	**No**	**Notes**
☒	☐	The reason why the functional language does (or does not) limit the claim scope is: because the functional language modifies the structure (the one or more sequence modifications) recited in the claim. The function describes the result (a required functional characteristic) of the amino acid sequence being modified, and thus imposes limits on the structure of the enzyme.

Part III: Definiteness of Functional Language

While functional limitations may be properly used in claims, the boundaries imposed by a functional limitation must be clearly defined to be definite under 35 U.S.C. 112(b). Claim language that merely states a result to be obtained without providing boundaries on the claim scope (*e.g*., by not specifying any way to achieve those results) is unclear. Consider the following to determine whether a claim limitation expressed in functional language has clear boundaries: whether one of ordinary skill in the art can determine what structure, material or act in the claim performs this function; whether the limitation has well defined boundaries or only expresses a problem solved or intended result; and what an anticipatory reference would need to disclose in order to satisfy this claim limitation. These considerations are not all-inclusive or limiting.

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 4

When § 112(f) is invoked, the specification must adequately disclose a corresponding structure, material or act that performs the function. For "means"-type claims, an adequate disclosure requires that the corresponding structure or material is: (a) disclosed in a way that one of ordinary skill in the art will understand what specific structure or material the inventor has identified to perform the recited function; (b) sufficient to perform the entire function recited in the claim limitation; and (c) clearly linked to the function in the written description.

When the examiner determines that the boundaries of a claim are not reasonably clear, a rejection under § 112(b) should be made. Such a rejection puts the applicant on notice that it must fulfill its statutory duty under § 112(b) to ensure that claim language clearly defines the boundaries of the claim scope sought. In making a rejection, the examiner must identify the specific claim language that is indefinite, and explain why that language renders the boundaries of the claim unclear. When possible, the examiner should suggest how the indefiniteness issues may be resolved.

For more information, refer to MPEP 2173.02, 2173.05(g), 2181 and 2182, and the following training modules*: Enhancing Clarity By Ensuring That Claims Are Definite Under 35 U.S.C. 112(b)*; *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; *35 U.S.C. 112(f): Broadest Reasonable Interpretation and Definiteness of § 112(f) Limitations*; and *35 U.S.C. 112(f): Evaluating § 112(f) Limitations in Software-Related Claims for Definiteness under 35 USC 112(b)*.

For § 112(f) limitations:

4. If the functional language is part of a "means"-type § 112(f) limitation, answer the following questions about the corresponding structure or material. Otherwise, skip to Question 5.

A) Does the specification disclose or describe a structure or material as performing the claimed function?

Yes	No	Notes
☐	☐	The corresponding structure or material is:

B) Is the disclosed or described structure or material sufficient to perform the entire claimed function?

Yes	No	Notes
☐	☐	The reason is:

C) Does the specification clearly link the structure or material to the claimed function?

Yes	No	Notes
☐	☐	The reason is:

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 4

For functional language that does not invoke § 112(f):

5. Are the boundaries of the functional language clear, *i.e.*, can one of ordinary skill in the art draw the boundary between what is covered by the claim and what is not covered?

Yes	No	Notes
☒	☐	The boundaries of the functional language are: clear. Although the claim has a broad scope (*i.e.*, it encompasses any sequence modification(s) that cause the enzyme to have increased thermostability), the functional language provides certain claim boundaries because it informs the person of ordinary skill in the art as to how the enzyme is provided with the claimed functional characteristic of increased thermostability (*i.e.*, by modifying the enzyme's amino acid sequence). One of ordinary skill in the art would understand the boundaries of this claim imposed by the recited structural elements.

Following Question 4 or 5, for § 112(f) limitations <u>and</u> limitations that do not invoke § 112(f):

6. Should the claim be rejected as indefinite under 35 U.S.C. 112(b)?

Yes	No	Notes
☐	☒	The indefinite claim language is: This limitation is unclear because: A suggestion for how applicant could resolve the unclear boundaries is:

Part IV: Addressing Functional Language

Examiners should keep in mind that, under the principles of compact prosecution, each claim should be examined for compliance with every statutory requirement for patentability in the initial review of the application. Thus, when the examiner determines that a claim term or phrase renders the claim indefinite, the examiner should make a rejection based on indefiniteness under 35 U.S.C. 112(b), as well as any other applicable rejection (*e.g.*, under 35 U.S.C. §§ 101, 102, 103, and/or 112).

When functional claim language is found indefinite, it typically lacks an adequate written description under § 112(a), because an indefinite, unbounded functional limitation would cover all ways of performing a function and indicate that the inventor has not provided sufficient disclosure to show possession of the invention. Thus, in most cases, a § 112(b) rejection that is based on functional language having unclear (or no) claim boundaries should be accompanied by a rejection under § 112(a) based on failure to provide a written description for the claim.

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 4

Because functional claim language that is not limited to a specific structure covers all devices that are capable of performing the recited function or all materials that have the functional characteristic, a rejection under §§ 102 or 103 may be appropriate if the prior art discloses a device that can inherently perform the claimed function or a material that inherently has the functional characteristic. When making a rejection, it is important that the examiner state on the record how the functional claim term or phrase is being interpreted with respect to the prior art applied in the rejection.

For more information, refer to MPEP 2173.05(g), 2182, and 2183, and the following training modules: *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; and *35 U.S.C. 112(f): Broadest Reasonable Interpretation and Definiteness of § 112(f) Limitations*.

Group Discussion:

Assume that prior art reference X was published by another several years prior to applicant's earliest filing date (*i.e.*, X qualifies as prior art under § 102) and teaches elements that meet all the structural elements recited in this claim.

Using the BRI of this claim taking into account any limits imposed by the functional language, what prior art rejections would be appropriate? Consider scenarios where X explicitly discloses the recited function or where the structure in X performs the function with the same means, an equivalent means or a different means. If the claim has been found indefinite, assume that the best possible understanding of the claim is being used in the prior art rejection for purposes of compact prosecution.

> Discussion points: In this case, the functional language limits the claim to an enzyme in which one or more amino acids are modified in a manner that results in increasing the thermostability of the enzyme. Thus, if X's composition is provided with the functional characteristic in a different way (*e.g.*, by adding a stabilizer molecule or adjusting the pH of the detergent composition), it cannot anticipate claim 1. The claim does not specify which residues to modify or the type(s) of modification that are needed to increase the thermostability (*e.g.*, substitution, insertion, or deletion). So even if X's disclosed enzyme has the functional characteristic due to a different modification (*e.g.*, an insertion at a position corresponding to position 100 of SEQ ID NO: 6), it can anticipate claim 4 because claim 4 is not limited to applicant's disclosed modifications (*i.e.*, substitution at one or more positions corresponding to positions 50, 61 and 105 of SEQ ID NO: 6).
>
> If X is silent as to the functional characteristic, it cannot anticipate claim 4, unless it can be shown that the increased thermostability is an inherent property of X's disclosed laundry detergent composition. For example, if X teaches an enzyme with a deletion modification at a particular amino acid position, such a modification may inherently result in an increased thermostability because an enzyme's functional characteristics are a natural consequence of its structure/amino acid sequence.

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 5

This worksheet is used in the **2016 Functional Language Workshop** to facilitate the discussion of the interpretation and definiteness under 35 U.S.C. 112(b) of hypothetical product claims reciting functional language. As every claim must be examined individually based on the particular elements recited therein, a separate worksheet should be used to analyze each claim. The use of this worksheet during examination is optional.

Note: This answer key includes answers to the questions on the worksheet, as well as additional explanations drawn from the MPEP and recent training. Although examiners should be familiar with the recent training prior to participating in this workshop, pertinent resources are referenced herein so that examiners can obtain more information if needed.

Example: Laundry Detergent **Claim:** 5

5. A laundry detergent composition comprising:
a) a cleaning adjunct selected from the group consisting of a bleach, a fragrance, and a surfactant; and
b) a variant alpha-amylase enzyme having an amino acid sequence that has at least 90% identity to SEQ ID NO: 6, with
(c) means for ***causing the variant alpha-amylase enzyme to have increased thermostability relative to BSG***.

Part I: Identifying Functional Language

As a first step, functional limitations in the claim should be identified. A claim limitation is functional when it recites a feature by *what it does* rather than by *what it is*. Claims often use functional language to add further description to some structure or action, for example how elements or steps tie together, or to provide context to claim elements. Functional language can appear in limitations that invoke 35 U.S.C. 112(f) ("means-plus-function"), and in limitations that do not invoke § 112(f). Limitations that do not invoke § 112(f) are typically recited with some structure, material or action to define a particular capability or purpose served by the recited structure, material or action. For more information, refer to MPEP 2111 and 2181, and the following training modules: *Broadest Reasonable Interpretation (BRI) and the Plain Meaning of Claim Terms*; *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; *35 U.S.C. 112(f): Identifying Limitations That Invoke 112(f)*; and *35 U.S.C. § 112(f): Making the Record Clear*.

This claim includes at least one instance of functional language, which is:

"causing the variant alpha-amylase enzyme to have increased thermostability relative to BSG"

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 5

1. Does the claim element including this functional language invoke 35 U.S.C. 112(f)?

Use the three-prong analysis in MPEP 2181 to determine whether the claim limitation invokes § 112(f).

Yes	No	Notes
☒	☐	Prong A is met because: claim element (c) recites "means". Prong B is met because: the term "means" is modified by functional language ("causing the variant alpha-amylase enzyme to have increased thermostability…"). Prong C is met because: claim element (c) is not further modified by sufficient structure or material for performing the claimed function.

Part II: Construing Functional Language

During examination, claims are given their broadest reasonable interpretation (BRI) in light of the specification as it would be interpreted by one of ordinary skill in the art. It is a best practice to make the record clear during prosecution by explaining the BRI of claim terms, as necessary, including explaining the BRI of any functional language. When § 112(f) is invoked, the BRI of the "means-plus-function" limitation is restricted to the corresponding structure in the supporting disclosure, and its equivalents (the corresponding specification that identifies and links the structure, material or act to the function recited in the claim is considered to be part of the claim limitation). When § 112(f) is not invoked and an element is recited along with a function, that element is construed as being capable of performing the function – in other words, the BRI of that element is limited by the function.

It should be kept in mind, however, that there is a distinction between reciting a function compared to reciting an intended use or result. A functional limitation can provide a patentable distinction (limit the claim scope) by imposing limits on the function of a structure, material or action. Typically no patentable distinction (no limit on the claim scope) is made by an intended use or result unless some structural difference is imposed by the use or result on the structure or material recited in the claim, or some manipulative difference is imposed by the use or result on the action recited in the claim.

For more information, refer to MPEP 2111 and 2181, and the following training modules: *Broadest Reasonable Interpretation (BRI) and the Plain Meaning of Claim Terms*; *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; and *35 U.S.C. 112(f): Broadest Reasonable Interpretation and Definiteness of § 112(f) Limitations*.

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 5

2. What is the broadest reasonable interpretation (BRI) of the functional language? Answer part A if the functional language does not invoke § 112(f), and Part B if the functional language is part of a § 112(f) limitation.

A. BRI if § 112(f) is <u>not</u> invoked
The structure, material or act in the claim that is connected to (*i.e*., performs) the recited function is: The BRI of the functional language is:

B. BRI if § 112(f) is invoked
The corresponding structure, material or act in the specification that performs the recited function is: substitution modification at one or more positions corresponding to positions 50, 61 and 105 of SEQ ID NO: 6. The BRI of the § 112(f) limitation is: substitution modification at one or more positions corresponding to positions 50, 61 and 105 of SEQ ID NO: 6, and equivalents thereof.

3. Does the functional language limit the claim scope (*i.e.*, must a prior art reference disclose this functional limitation in order to anticipate the claim)?

Yes	No	Notes
☒	☐	The reason why the functional language does (or does not) limit the claim scope is: the statute requires a 112(f) limitation to be interpreted as being limited to the corresponding structure (or material or acts) described in the specification, and equivalents thereof. A reference must disclose the corresponding structure or its equivalent in order to anticipate the claim.

Part III: Definiteness of Functional Language

While functional limitations may be properly used in claims, the boundaries imposed by a functional limitation must be clearly defined to be definite under 35 U.S.C. 112(b). Claim language that merely states a result to be obtained without providing boundaries on the claim scope (*e.g.*, by not specifying any way to achieve those results) is unclear. Consider the following to determine whether a claim limitation expressed in functional language has clear boundaries: whether one of ordinary skill in the art can determine what structure, material or act in the claim performs this function; whether the limitation has well defined boundaries or only expresses a problem solved or intended result; and what an anticipatory reference would need to disclose in order to satisfy this claim limitation. These considerations are not all-inclusive or limiting.

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 5

When § 112(f) is invoked, the specification must adequately disclose a corresponding structure, material or act that performs the function. For "means"-type claims, an adequate disclosure requires that the corresponding structure or material is: (a) disclosed in a way that one of ordinary skill in the art will understand what specific structure or material the inventor has identified to perform the recited function; (b) sufficient to perform the entire function recited in the claim limitation; and (c) clearly linked to the function in the written description.

When the examiner determines that the boundaries of a claim are not reasonably clear, a rejection under § 112(b) should be made. Such a rejection puts the applicant on notice that it must fulfill its statutory duty under § 112(b) to ensure that claim language clearly defines the boundaries of the claim scope sought. In making a rejection, the examiner must identify the specific claim language that is indefinite, and explain why that language renders the boundaries of the claim unclear. When possible, the examiner should suggest how the indefiniteness issues may be resolved.

For more information, refer to MPEP 2173.02, 2173.05(g), 2181 and 2182, and the following training modules*: Enhancing Clarity By Ensuring That Claims Are Definite Under 35 U.S.C. 112(b)*; *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; *35 U.S.C. 112(f): Broadest Reasonable Interpretation and Definiteness of § 112(f) Limitations*; and *35 U.S.C. 112(f): Evaluating § 112(f) Limitations in Software-Related Claims for Definiteness under 35 USC 112(b)*.

For § 112(f) limitations:

4. If the functional language is part of a "means"-type § 112(f) limitation, answer the following questions about the corresponding structure or material. Otherwise, skip to Question 5.

A) Does the specification disclose or describe a structure or material as performing the claimed function?

Yes	No	Notes
☒	☐	The corresponding structure or material is: substitution modification at one or more positions corresponding to positions 50, 61 and 105 of SEQ ID NO: 6.

B) Is the disclosed or described structure or material sufficient to perform the entire claimed function?

Yes	No	Notes
☒	☐	The reason is: these particular sequence modifications are described as achieving the increased thermostability function.

FUNCTIONAL LANGUAGE WORKSHEET ANSWER KEY
LAUNDRY DETERGENT: CLAIM 5

C) Does the specification clearly link the structure or material to the claimed function?

Yes	No	Notes
☒	☐	The reason is: the specification describes these particular sequence modifications as achieving the increased thermostability function, which is a clear link.

For functional language that does not invoke § 112(f):

5. Are the boundaries of the functional language clear, *i.e.*, can one of ordinary skill in the art draw the boundary between what is covered by the claim and what is not covered?

Yes	No	Notes
☐	☐	The boundaries of the functional language are:

Following Question 4 or 5, for § 112(f) limitations and limitations that do not invoke § 112(f):

6. Should the claim be rejected as indefinite under 35 U.S.C. 112(b)?

Yes	No	Notes
☐	☒	The indefinite claim language is: This limitation is unclear because: A suggestion for how applicant could resolve the unclear boundaries is:

Part IV: Addressing Functional Language

Examiners should keep in mind that, under the principles of compact prosecution, each claim should be examined for compliance with every statutory requirement for patentability in the initial review of the application. Thus, when the examiner determines that a claim term or phrase renders the claim indefinite, the examiner should make a rejection based on indefiniteness under 35 U.S.C. 112(b), as well as any other applicable rejection (*e.g.*, under 35 U.S.C. §§ 101, 102, 103, and/or 112).

When functional claim language is found indefinite, it typically lacks an adequate written description under § 112(a), because an indefinite, unbounded functional limitation would cover all ways of performing a function and indicate that the inventor has not provided sufficient disclosure to show possession of the invention. Thus, in most cases, a § 112(b) rejection that is based on functional language having unclear (or no) claim boundaries should be accompanied by a rejection under § 112(a) based on failure to provide a written description for the claim.

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Because functional claim language that is not limited to a specific structure covers all devices that are capable of performing the recited function or all materials that have the functional characteristic, a rejection under §§ 102 or 103 may be appropriate if the prior art discloses a device that can inherently perform the claimed function or a material that inherently has the functional characteristic. When making a rejection, it is important that the examiner state on the record how the functional claim term or phrase is being interpreted with respect to the prior art applied in the rejection.

For more information, refer to MPEP 2173.05(g), 2182, and 2183, and the following training modules: *Examining Functional Claim Limitations: Focus on Computer/Software-related Claims*; and *35 U.S.C. 112(f): Broadest Reasonable Interpretation and Definiteness of § 112(f) Limitations*.

Group Discussion:

Assume that prior art reference X was published by another several years prior to applicant's earliest filing date (*i.e.*, X qualifies as prior art under § 102) and teaches elements that meet all the structural elements recited in this claim.

Using the BRI of this claim taking into account any limits imposed by the functional language, what prior art rejections would be appropriate? Consider scenarios where X explicitly discloses the recited function or where the structure in X performs the function with the same means, an equivalent means or a different means. If the claim has been found indefinite, assume that the best possible understanding of the claim is being used in the prior art rejection for purposes of compact prosecution.

> Discussion points: In this case, the functional language limits the claim to an enzyme having substitution modification(s) at one or more positions corresponding to positions 50, 61 and 105 of SEQ ID NO: 6, and equivalents thereof. If X teaches an enzyme having the corresponding structure (substitution modification(s) at one or more positions corresponding to positions 50, 61 and 105 of SEQ ID NO: 6), then it anticipates claim 5. The increased thermostability is an inherent functional characteristic of these specific modifications (because an enzyme's functional characteristics are a natural consequence of its structure/amino acid sequence), and thus it does not matter whether X explicitly discloses the functional characteristic.
>
> If X teaches an equivalent structure (*e.g.*, an enzyme having a substitution modification at a different amino acid position that produces substantially the same increase in thermostability in substantially the same way) that has the functional characteristic of increased thermostability, it can anticipate claim 5. If X is silent as to the functional characteristic, it cannot anticipate claim 5, unless it can be shown that the increased thermostability is inherent in X's disclosed equivalent structure.
>
> If X teaches a non-equivalent structure as accomplishing the function, it can render claim 5 obvious.