

## 510(k) Summary

**Introduction:** According to the requirements of 21 CFR 807.92, the following information provides sufficient details to understand the basis for determination of substantial equivalence.

The assigned 510(k) Number: **K140541**

1. **Submitter**

**Mailing Address:** Siemens Healthcare Diagnostics Inc.  
511 Benedict Avenue  
Tarrytown, NY 10591

**Contact Person:** Garo Mimaryan, MS, RAC  
Senior Regulatory Affairs Specialist

**Phone Number:** (914)-524-3270

**Fax Number:** (914)-524-2101

**E-mail Address:** garo.mimaryan@siemens.com

**Date Prepared:** March 27, 2014

2. **Device Name**

**Proprietary Name:** IMMULITE® 2000 C-Peptide Calibration Verification Material  
**Measurand:** Quality Control materials for IMMULITE® 2000 C-Peptide assay  
**Type of Test:** Calibration Verification Material (CVM) for IMMULITE® 2000 C-Peptide assay

**Regulation Section:** 21 CFR 862.1660, Quality Control Material

**Classification:** Class I Reserved

**Products Code:** JJX – Single (Specified) Analyte Controls (Assayed and Unassayed)

**Panel:** Clinical Chemistry (75)

3. **Predicate Device Name**

IMMULITE® 2000 Growth Hormone Calibration Verification Material (CVM)

**Predicate 510(k) No:** K133128

4. **Device Description:**

The C-Peptide Calibration Verification Material (CVM) contains one set of four vials each 2mL. CVM1 contains a lyophilized buffered human albumin with bovine protein, 0.197% sodium azide and preservative. CVM2, CVM3 and CVM4 contain various levels of lyophilized C-Peptide in buffered human albumin with bovine protein, 0.197% sodium azide and preservative. CVMs are supplied frozen in a lyophilized form.

5. **Intended Use:**

**Indication for Use:** See Indications for Use Statement below

The IMMULITE® C-Peptide Calibration Verification Material (CVM) is for in vitro diagnostic use in the verification of calibration of the IMMULITE C-Peptide assay on the IMMULITE 2000 systems

**Special Conditions for Use Statement(s):**

**Special Instrument Requirements:**

For prescription use only  
IMMULITE® 2000 Systems

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6. **Technological Characteristics and Substantial Equivalence Comparison with Predicate:** A comparison of the device features, intended use, and other information demonstrates that the IMMULITE® 2000 C-Peptide Calibration Verification Material (CVM) is substantially equivalent to the predicate device as summarized in Table 1.

Table 1: Substantial Equivalence Comparison

<b>SIMILARITIES</b>		
	<b>Candidate Device IMMULITE 2000 C-Peptide CVM</b>	<b>Predicate Device IMMULITE 2000 Growth Hormone CVM</b>
<b>Intended Use</b>	The IMMULITE® C-Peptide Calibration Verification Material (CVM) is for in vitro diagnostic use in the verification of calibration of the IMMULITE C-Peptide assay on the IMMULITE 2000 systems.	The IMMULITE® Growth Hormone Calibration Verification Material (CVM) is for in vitro diagnostic use in the verification of calibration of the IMMULITE Growth Hormone assay on the IMMULITE 2000 systems
<b>Form</b>	Lyophilized	Same
<b>Storage</b>	2-8°C	Same
<b>Stability</b>	Stable unopened until the expiration date	Same
<b>Levels</b>	4	Same
<b>Use</b>	Single Use Only	Same
<b>DIFFERENCES</b>		
	<b>Candidate Device IMMULITE 2000 C-Peptide CVM</b>	<b>Predicate Device IMMULITE 2000 Growth Hormone CVM</b>
<b>Analyte</b>	C-Peptide	Growth Hormone
<b>Matrix</b>	Human Albumin* with preservatives	Equine Serum with preservatives

\*This material was tested negative for HIV-1, HIV-2 and hepatitis by FDA approved methods.

7. **Non-Clinical Performance Testing**

Performance testing has been carried out to demonstrate that this device meets the performance specifications for its intend use. The following tests were performed on the candidate device.

**Stability Summary:**

The stability study was conducted to validate shelf life claim for the IMMULITE 2000 C-Peptide Calibration Verification Material (CVM) to ensure that it maintains optimal product performance on IMMULITE 2000 platforms throughout the established shelf life of the CVM. The Calibration Verification Materials are stable up to 6 years when stored at 2-8°C prior to opening and stable for 8 hours at room (ambient) temperature (15-25°C) after reconstitution.

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## Shelf life Stability Protocol Summary:

The CVM study protocols are run as part of the calibrator stability testing. As summarized in Table 2, the testing was run in duplicate (at the minimum) and contains time-points at which the testing was performed.

Table 2: Shelf life Stability Protocol Summary

CVM Level	Time-Points (Days)			
	LPEPCVM1	1	1642	1825
LPEPCVM2	1	1642	1825	2190
LPEPCVM3	1	1642	1825	2190
LPEPCVM4	1	1642	1825	2190

## Shelf life Stability Acceptance Criteria Summary:

The Acceptance Criteria for the IMMULITE C-Peptide criteria which require dose value of stability CVM to fall between  $\pm 15\%$  of assigned dose for CVM levels 2 and 4 and  $\pm 10\%$  of assigned dose for CVM level 3. Part 2 review limits criteria which require dose value of the controls to be within 2SD of the control target value when generated from the stability calibrator curve. If the result is not within acceptable dose range of  $\pm 15\%$  for levels 2 and 4 and  $\pm 10\%$  for level 3 then an additional data review is conducted using part 2 criteria

## Open Vial Stability Protocol Summary:

As summarized in Table 3, The C-Peptide CVMs were tested at 2-hourly intervals for up to 9 hours at room temperature (ambient) conditions.

Table 3: Open Vial Stability Protocol Summary

CVM Level	Time-Points (Hours)			
	LPEPCVM1	0	2	4
LPEPCVM2	0	2	4	8
LPEPCVM3	0	2	4	8
LPEPCVM4	0	2	4	8

## Open Vial Stability Acceptance Criteria Summary:

The Acceptance Criteria for the Open Vial Stability are the same as the Shelf life Stability Acceptance criteria.

## Traceability:

The IMMULITE C-Peptide CVMs are traceable to WHO 1st IRP 84/510. The CVMs are manufactured using qualified materials and measurement procedures.

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## Value Assignment:

The IMMULITE C-Peptide CVMs are 4 level materials which are a subset of 10 level Total C-Peptide calibrators. Calibrators are not commercialized but are used internally during manufacture and release testing of C-Peptide reagents and two point adjustors. The IMMULITE calibrators and therefore CVMs are value assigned using assigned reference calibrators. The CVMs are manufactured using qualified materials and measurement procedures. The CVMs dose values are generated using curve generated by assigned reference calibrators. The CVM values are calculated based on the recovered values for each run on each instrument independently. CVM values are then averaged across all systems. Quality control is performed by calculating the recovery of patient samples, spiked patient samples and controls using the assigned CVM values. The controls must fall within their target ranges. Six levels of commercially available controls and 59 normal patient samples were used to validate CVM value assignments.

## Expected Values/Target Values/Reference Range:

Each CVM level was tested for a total of 27 replicates; 9 runs and 3 replicates per run, 5 different reagent kit lots and 9 IMMULITE 2000 systems. The Guideline Range (95% confidence interval) for each CVM level was established based on the Target Mean and  $\pm 2$  Standard Deviation (SD). The target values are provided in the IMMULITE<sup>®</sup> 2000 CVM Calibration verification Material lot-specific value card. The expected assay range is 0.1 - 20 ng/mL. The target values in Table 4 can be considered as guidelines.

**Table 4:** Analyte Target Range Values

Analyte target levels	CVM Level	Target Mean (ng/mL)	Standard Deviation (SD)	Target Range (ng/mL)	
	LPEPCVM1	0.00	-	0.00	$\leq 0.1$
LPEPCVM2	0.520	0.039	0.442	0.598	
LPEPCVM3	8.85	0.4425	7.97	9.74	
LPEPCVM4	25.6	-	-	-	
( 80% LPEPCVM4 + 20% LPEPCVM1 )	20.5	1.55	17.4	23.6	
<b>Assay Range</b>	0.1 - 20 ng/mL				

\*Note: LPEPCVM4 requires dilution to ensure the target value is within +10% of the top of the reportable range of the assay.

Each laboratory should establish their limits for acceptability based on methodology, clinical significance and medical decision levels of the test analyte. The representative, total precision tabulated in the respective assay instructions for use may be considered as one factor when establishing local, acceptable ranges. The values provided above may be considered as guidelines. Value assignment is lot specific.

## Standard/Guidance Documents Referenced:

- CEN 13640 Stability Testing of In Vitro Diagnostic Reagents
- Guidance for Industry – Abbreviated 510(k) Submissions for In Vitro Diagnostic Calibrators
- Guidance for Industry and FDA Staff – Assayed and Unassayed Quality Control Material

## Proposed Labeling:

The labeling is sufficient and it satisfies the requirements of 21 CFR Part 809.10

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9. **Conclusion:**

The IMMULITE® 2000 C-Peptide Calibration Verification Material is substantially equivalent to the predicate device intended for similar use. The substantial equivalence of the device is supported by the non-clinical testing and was found to be comparable and supports the claims of substantial equivalence, product safety and effectiveness. Based on the testing completed and the comparisons with predicate device, the IMMULITE® 2000 C-Peptide Calibration Verification Material does not raise any new questions on safety and effectiveness and the results support a determination of substantial equivalence.

# SIEMENS

## 510(k) Summary

**Introduction:** According to the requirements of 21 CFR 807.92, the following information provides sufficient details to understand the basis for determination of substantial equivalence.

**The assigned 510(k) Number:** K140541

**1. Submitter**

**Mailing Address:** Siemens Healthcare Diagnostics Inc.  
511 Benedict Avenue  
Tarrytown, NY 10591

**Contact Person:** Garo Mimaryan, MS, RAC  
Senior Regulatory Affairs Specialist

**Phone Number:** (914)-524-3270

**Fax Number:** (914)-524-2101

**E-mail Address:** garo.mimaryan@siemens.com

**Date Prepared:** March 27, 2014

**2. Device Name**

**Proprietary Name:** IMMULITE® 2000 SHBG Calibration Verification Material  
**Measurand:** Quality Control materials for IMMULITE® 2000 SHBG assay  
**Type of Test:** Calibration Verification Material (CVM) for IMMULITE® 2000 SHBG assay

**Regulation Section:** 21 CFR 862.1660, Quality Control Material

**Classification:** Class I Reserved

**Products Code:** JJX – Single (Specified) Analyte Controls (Assayed and Unassayed)

**Panel:** Clinical Chemistry (75)

**3. Predicate Device Name**

**Predicate 510(k) No:** IMMULITE 2000 Growth Hormone CVM

K133128

**4. Device Description:**

IMMULITE® 2000 SHBG Calibration Verification Material (CVM) contains one set of four vials, 2mL (CVM1) and 2 mL (CVM2, CVM3 and CVM4) each. CVM1 contains a lyophilized buffered bovine protein/buffer matrix with 3.64% sodium azide and preservative. CVM2, CVM3, and CVM4 contain various levels of lyophilized SHBG in bovine protein/buffer matrix with 3.64% sodium azide and preservative. CVMs are supplied frozen in lyophilized form.

**5. Intended Use:**

**Indication for Use:**

See Indications for Use Statement below

The IMMULITE® SHBG Calibration Verification Material (CVM) is for in vitro diagnostic use in the verification of calibration of the IMMULITE SHBG assay on the IMMULITE 2000 systems

**Special Conditions for Use Statement(s):**

**Special Instrument Requirements:**

For prescription use only  
IMMULITE® 2000 Systems

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6. **Technological Characteristics and Substantial Equivalence Comparison with Predicate:** A comparison of the device features, intended use, and other information demonstrates that the IMMULITE® 2000 SHBG Calibration Verification Material (CVM) is substantially equivalent to the predicate device as summarized in Table 1.

Table 1: Substantial Equivalence Comparison

<b>SIMILARITIES</b>		
	<b>Candidate Device IMMULITE 2000 SHBG CVM</b>	<b>Predicate Device IMMULITE 2000 Growth Hormone CVM</b>
<b>Intended Use</b>	The IMMULITE® SHBG Calibration Verification Material (CVM) is for in vitro diagnostic use in the verification of calibration of the IMMULITE SHBG assay on the IMMULITE 2000 systems	The IMMULITE® Growth Hormone Calibration Verification Material (CVM) is for in vitro diagnostic use in the verification of calibration of the IMMULITE Growth Hormone assay on the IMMULITE 2000 systems
<b>Form</b>	Lyophilized	Same
<b>Storage</b>	2-8°C	Same
<b>Stability</b>	Stable unopened until the expiration date	Same
<b>Levels</b>	4	Same
<b>Use</b>	Single Use Only	Same
<b>DIFFERENCES</b>		
	<b>Candidate Device IMMULITE 2000 SHBG CVM</b>	<b>Predicate Device IMMULITE 2000 Growth Hormone CVM</b>
<b>Analyte</b>	SHBG	Growth Hormone
<b>Matrix</b>	Buffered bovine/protein with preservatives	Equine Serum with preservatives

7. **Non-Clinical Performance Testing**

Performance testing has been carried out to demonstrate that this device meets the performance specifications for its intended use. The following tests were performed on the candidate device.

**Stability Summary:**

The stability study was conducted to validate shelf life claim for the IMMULITE 2000 SHBG Calibration Verification Material (CVM) to ensure that it maintains optimal product performance on IMMULITE 2000 platforms throughout the established shelf life of the CVM. The Calibration Verification Materials are stable up to 9 years when stored at 2-8°C prior to opening and stable for 8 hours at room (ambient) temperature (15-25°C) after reconstitution.

**Shelf Life Stability Protocol Summary:**

The CVM study protocols are run as part of the calibrator stability testing. As summarized in Table 2, the testing was run in duplicate (at the minimum) and contains time-points at which the testing was performed.

**Table 2: Shelf Life Stability Protocol Summary**

CVM Level	Time-Points (Days)			
	LSHCVM1	1	2190	2555
LSHCVM2	1	2190	2555	3285
LSHCVM3	1	2190	2555	3285
LSHCVM4	1	2190	2555	3285

**Shelf Life Stability Acceptance Criteria Summary:**

The Acceptance Criteria for the IMMULITE SHBG Calibration Verification Material (CVM) are in 2 parts. Part 1 consists of the guideline acceptance criteria which require dose value of stability CVM to fall between  $\pm 10\%$  of assigned dose for CVM levels 2 & 3 and  $\pm 20\%$  of assigned dose for CVM level 4. Part 2 review limits criteria which require dose value of the controls to be within 2SD of the control target value when generated from the stability calibrator curve. If the result is not within acceptable dose range of  $\pm 10\%$  for levels 2 & 3 and  $\pm 20\%$  for level 4 then additional data review is conducted using part 2 criteria.

**Open Vial Stability Protocol Summary:**

As summarized in Table 3, SHBG CVMs were tested at 2-hourly intervals for up to 9 hours at room temperature (ambient) conditions.

**Table 3: Open Vial Stability Protocol Summary**

CVM Level	Time-Points (Hours)			
	LSHCVM1	0	2	4
LSHCVM2	0	2	4	8
LSHCVM3	0	2	4	8
LSHCVM4	0	2	4	8

**Open Vial Stability Acceptance Criteria Summary:**

The Acceptance Criteria for the Open Vial Stability are the same as the Shelf life Stability Acceptance criteria.

**Traceability:**

The IMMULITE SHBG CVMs are traceable to an internal material which has been gravimetrically prepared. The CVMs are manufactured using qualified materials and measurement procedures.

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## Value Assignment:

The IMMULITE SHBG CVMs are 4 level materials which are a subset of 9 level SHBG calibrators. Calibrators are not commercialized but are used internally during manufacture and release testing of SHBG reagents and two point adjustors. The IMMULITE calibrators and therefore CVMs are value assigned using assigned reference calibrators. The CVMs dose values are generated using curve generated by assigned reference calibrators. The CVM values are calculated based on the recovered values for each run on each instrument independently. The CVM values are then averaged across all systems. Quality control is performed by calculating the recovery of patient samples and controls using the assigned CVM values. The controls must fall within their target ranges. Four levels of commercially available controls and 28 normal patient samples were used to validate CVM value assignments. Quality control is performed by calculating the recovery of patient samples, spiked patient samples and controls using the assigned CVM values. The controls must fall within their target ranges

## Expected Values/Target Values/Reference Range:

The CVMs are manufactured using qualified materials and measurement procedures. The SHBG CVMs were tested on 27 replicates in total comprised of 9 runs and 3 replicates per run on 8 IMMULITE 2000 systems and 1 reagent kit lot. The CVMs dose values are generated using curve generated by assigned reference calibrators. The CVM values are calculated based on the recovered values for each run on each instrument independently. The CVM values are then averaged across all systems. Quality control is performed by calculating the recovery of patient samples and controls using the assigned CVM values. The Guideline Range (95% confidence interval) for each CVM level was established based on the Target Mean and  $\pm 2$  Standard Deviation (SD). The expected assay range is 2-180 nmol/L. The target values in Table 4 can be considered as guidelines.

**Table 4: Analyte Target Range Levels**

Analyte target levels	CVM Level	Target Mean (nmol/L)	Standard Deviation (SD)	Target Range (nmol/L)	
	LSHCVM1	0.00	-	0.00	$\leq 2.0$
	LSHCVM2	6.00	0.3	5.40	6.60
	LSHCVM3	47.2	2.6	42	52.4
	*LSHCVM4	216	-	-	-
	( 85% LSHCVM4 + 15% LSHCVM1)	184	18.5	147	221
<b>Assay Range</b>	2 - 180 nmol/L				

\*Note: LSHCVM4 requires dilution to ensure the target value is within +10% of the top of the reportable range of the assay.

Each laboratory should establish their limits for acceptability based on methodology, clinical significance and medical decision levels of the test analyte. The representative, total precision tabulated in the respective assay instructions for use may be considered as one factor when establishing local, acceptable ranges. The values provided above may be considered as guidelines. Value assignment is lot specific.

## Standard/Guidance Documents Referenced:

- CEN 13640 Stability Testing of In Vitro Diagnostic Reagents
- Guidance for Industry – Abbreviated 510(k) Submissions for In Vitro Diagnostic Calibrators
- Guidance for Industry and FDA Staff – Assayed and Unassayed Quality Control Material

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Proposed Labeling:

The labeling is sufficient and it satisfies the requirements of 21 CFR Part 809.10

9. Conclusion:

The IMMULITE® 2000 SHBG Calibration Verification Material is substantially equivalent to the predicate device intended for similar use. The substantial equivalence of the device is supported by the non-clinical testing and was found to be comparable and supports the claims of substantial equivalence, product safety and effectiveness. Based on the testing completed and the comparisons with predicate device, the IMMULITE® 2000 SHBG Calibration Verification Material does not raise any new questions on safety and effectiveness and the results support a determination of substantial equivalence.

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## 510(k) Summary

**Introduction:** According to the requirements of 21 CFR 807.92, the following information provides sufficient details to understand the basis for determination of substantial equivalence.

**The assigned 510(k) Number:** K140541

**1. Submitter**

**Mailing Address:** Siemens Healthcare Diagnostics Inc.  
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**Contact Person:** Garo Mimaryan, MS, RAC  
Senior Regulatory Affairs Specialist

**Phone Number:** (914)-524-3270

**Fax Number:** (914)-524-2101

**E-mail Address:** garo.mimaryan@siemens.com

**Date Prepared:** March 27, 2014

**2. Device Name**

**Proprietary Name:** IMMULITE® 2000 Total Testosterone Calibration Verification Material  
**Measurand:** Quality Control materials for IMMULITE 2000 Total Testosterone  
**Type of Test:** Calibration Verification Material (CVM) for IMMULITE® 2000  
Total Testosterone assay

**Regulation Section:** 21 CFR 862.1660, Quality Control Material

**Classification:** Class I Reserved

**Products Code:** JJX – Single (Specified) Analyte Controls (Assayed and Unassayed)

**Panel:** Clinical Chemistry (75)

**3. Predicate Device Name**

**Predicate 510(k) No:** IMMULITE® 2000 HCG Calibration Verification Material  
K133128

**4. Device Description:**

IMMULITE® 2000 Total Testosterone Calibration Verification Material (CVM) contains one set of four vials, 2 mL each. CVM1 contains processed human serum with 0.98% sodium azide and other preservative. CVM2, CVM3, and CVM4 contain various levels of testosterone in processed human serum with 0.98% sodium azide and other preservative. The CVMs are supplied frozen in a liquid form.

**5. Intended Use:**

**Indication for Use:**

See Indications for Use Statement below

The IMMULITE® Total Testosterone Calibration Verification Material (CVM) is for in vitro diagnostic use in the verification of the IMMULITE Total Testosterone assay on the IMMULITE 2000 systems

**Special Conditions for Use Statement(s):**

**Special Instrument Requirements:**

For prescription use only  
IMMULITE® 2000 Systems

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**6. Technological Characteristics and Substantial Equivalence Comparison with Predicate:**

A comparison of the device features, intended use, and other information demonstrates that the IMMULITE® 2000 Total Testosterone Calibration Verification Material (CVM) is substantially equivalent to the predicate device, as summarized in Table 1.

Table 1: Substantial Equivalence Comparison

<b>SIMILARITIES</b>		
	<b>Candidate Device IMMULITE 2000 Total Testosterone CVM</b>	<b>Predicate Device IMMULITE 2000 HCG CVM</b>
<b>Intended Use</b>	The IMMULITE® Total Testosterone Calibration Verification Material (CVM) is for in vitro diagnostic use in the verification of calibration of the IMMULITE Total Testosterone assay on the IMMULITE 2000 systems	The IMMULITE® HCG Calibration Verification Material (CVM) is for in vitro diagnostic use in the verification of calibration of the IMMULITE HCG assay on the IMMULITE 2000 systems
<b>Form</b>	Liquid	Same
<b>Levels</b>	4	Same
<b>Matrix</b>	Human Serum* with preservatives	Same
<b>Stability</b>	Stable unopened until the expiration date	Same
<b>Storage</b>	≤20°C	Same
<b>Use</b>	Single Use Only	Same
<b>DIFFERENCES</b>		
	<b>Candidate Device IMMULITE 2000 Total Testosterone CVM</b>	<b>Predicate Device IMMULITE 2000 HCG CVM</b>
<b>Analyte</b>	Testosterone	HCG

\*This material was tested negative for HIV-1, HIV-2 and hepatitis by FDA approved methods.

**7. Non-Clinical Performance Testing**

Performance testing has been carried out to demonstrate that this device meets the performance specifications for its intend use. The following tests were performed on the candidate device.

**Stability Summary:**

The stability study was conducted to validate shelf life claim for the IMMULITE 2000 Total Testosterone CVM to ensure that it maintains optimal product performance on IMMULITE 2000 platforms throughout the established shelf life of the CVM. The Calibration Verification Materials are stable up to 26 months when stored at -20°C prior to opening and stable for 6 hours at room (ambient) temperature (15-25°C).

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## Shelf Life Stability Protocol Summary:

The CVM study protocols are run as part of the calibrator stability testing. As summarized in Table 2, the testing was run in duplicate (at the minimum) and contains time-points at which the testing was performed.

Table 2: Shelf Life Stability Protocol Summary

CVM Level	Time-Points (Days)			
	LTWCVM1	1	182	365
LTWCVM2	1	182	365	790
LTWCVM3	1	182	365	790
LTWCVM4	1	182	365	790

## Shelf Life Stability Acceptance Criteria Summary:

The Acceptance Criteria for the IMMULITE Total Testosterone criteria which require dose value of stability CVM to fall between  $\pm 15\%$  of assigned dose for CVM level 2,  $\pm 10\%$  of assigned dose for CVM level 3 and  $\pm 9\%$  of assigned dose for CVM level 4. Part 2 review limits criteria which require dose value of the controls to be within 2SD of the control target value when generated from the stability calibrator curve. If the result is not within acceptable dose range of  $\pm 15\%$  for level 2,  $\pm 10\%$  for level 3 and  $\pm 9\%$  for level 4 then additional data review is conducted using part 2 criteria.

## Open Vial Stability Protocol Summary:

As summarized in Table 3, The Total Testosterone CVMs were tested at 2-hourly intervals for up to 9 hours at room temperature (ambient) conditions.

Table 3: Open Vial Stability Protocol Summary

CVM Level	Time-Points (Hours)			
	LTWCVM1	0	2	4
LTWCVM2	0	2	4	8
LTWCVM3	0	2	4	8
LTWCVM4	0	2	4	8

## Open Vial Stability Acceptance Criteria Summary:

The Acceptance Criteria for the Open Vial Stability are the same as the Shelf life Stability Acceptance criteria.

## Traceability:

The IMMULITE Total Testosterone CVMs are traceable to an internal material which has been gravimetrically prepared. The CVMs are manufactured using qualified materials and measurement procedures.

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## Value Assignment:

The IMMULITE® 2000 Total Testosterone CVMs are 4 level materials which are a subset of 9 level Total Testosterone calibrators. Calibrators are not commercialized but are used internally during manufacture and release testing of Total Testosterone reagents and two point adjustors. The IMMULITE calibrators and therefore CVMs are value assigned using assigned reference calibrators. The CVMs dose values are generated using curve generated by assigned reference calibrators. The CVM values are calculated based on the recovered values for each run on each instrument independently. CVM values are then averaged across all systems. Quality control is performed by calculating the recovery of patient samples and controls using the assigned CVM values. Six levels of commercially available controls and 32 samples (23 spiked samples, 4 normal female and 5 normal male samples) were used to validate CVM value assignments. Quality control is performed by calculating the recovery of patient samples, spiked patient samples and controls using the assigned CVM values. The controls must fall within their target ranges

## Expected Values/Target Values/Reference Range:

The Total Testosterone CVMs were tested on 27 replicates in total comprised of 9 runs and 3 replicates per run, 9 IMMULITE 2000 systems and 5 different reagent kit lots. The CVMs dose values are generated using curve generated by assigned reference calibrators. The CVM values are calculated based on the recovered values for each run on each instrument independently. CVM values are then averaged across all systems. Quality control is performed by calculating the recovery of patient samples and controls using the assigned CVM values. The Guideline Range (95% confidence interval) for each CVM level was established based on the Target Mean and  $\pm 2$  Standard Deviation (SD). The expected assay range is 20-1600 ng/dL. The target values in Table 4 can be considered as guidelines.

**Table 4: Analyte Target Range Levels**

Analyte target levels	Level	Target Mean (ng/dL)	Standard Deviation (SD)	Target Range (ng/dL)	
	LTWCVM1	0.00	-	0.00	$\leq 0.20$
	LTWCVM2	73.5	13.675	46.3	101
	LTWCVM3	405	36.5	332	478
	*LTWCVM4	2016	-	-	-
	(80% LTWCVM4 + 20% LTWCVM1)	1613	121	1371	1855
<b>Assay Range</b>	<b>20 - 1600 ng/dL</b>				

\*Note: LTWCVM4 requires dilution to ensure the target value is within +10% of the top of the reportable range of

Each laboratory should establish their limits for acceptability based on methodology, clinical significance and medical decision levels of the test analyte. The representative, total precision tabulated in the respective assay instructions for use may be considered as one factor when establishing local, acceptable ranges. The values provided above may be considered as guidelines. Value assignment is lot specific.

## Standard/Guidance Documents Referenced:

- CEN 13640 Stability Testing of In Vitro Diagnostic Reagents
- Guidance for Industry – Abbreviated 510(k) Submissions for In Vitro Diagnostic Calibrators
- Guidance for Industry and FDA Staff – Assayed and Unassayed Quality Control Material

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Proposed Labeling:

The labeling is sufficient and it satisfies the requirements of 21 CFR Part 809.10

9. Conclusion:

The IMMULITE® 2000 Total Testosterone Calibration Verification Material is substantially equivalent to the predicate device intended for similar use. The substantial equivalence of the device is supported by the non-clinical testing and was found to be comparable and supports the claims of substantial equivalence, product safety and effectiveness. Based on the testing completed and the comparisons with predicate device, the IMMULITE® 2000 Total Testosterone Calibration Verification Material does not raise any new questions on safety and effectiveness and the results support a determination of substantial equivalence.



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration  
10903 New Hampshire Avenue  
Document Control Center - WO66-G609  
Silver Spring, MD 20993-0002

April 1, 2014

SIEMENS HEALTHCARE DIAGNOSTICS INC.  
GARO MIMARYAN  
SENIOR REG. AFFAIRS SPECIALIST  
511 BENEDICT AVE.  
TARRYTOWN NY 10591

Re: K140541

Trade/Device Name: IMMULITE® 2000 C-Peptide Calibration Verification Material,  
IMMULITE® 2000 SHBG Calibration Verification Material,  
IMMULITE® 2000 Total Testosterone Calibration Verification  
Material

Regulation Number: 21 CFR 862.1660

Regulation Name: Quality control material (assayed and unassayed)

Regulatory Class: I, Reserved

Product Code: JJX

Dated: February 28, 2014

Received: March 4, 2014

Dear Garo Mimaryan:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Parts 801 and 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820); and if applicable, the

electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

If you desire specific advice for your device on our labeling regulations (21 CFR Parts 801 and 809), please contact the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638 2041 or (301) 796-7100 or at its Internet address <http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm>. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to <http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm> for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address <http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm>.

Sincerely yours,

**Courtney H. Lias -S**

Courtney H. Lias, Ph.D.  
Director  
Division of Chemistry and Toxicology Devices  
Office of In Vitro Diagnostics  
and Radiological Health  
Center for Devices and Radiological Health

Enclosure

**Indications for Use**

510(k) Number (if known)  
k140541

Device Name  
IMMULITE®2000 C-Peptide Calibration Verification Material, IMMULITE®2000 SHBG Calibration Verification Material, and  
IMMULITE®2000 Total Testosterone Calibration Verification Material

Indications for Use (Describe)

The IMMULITE® C-Peptide Calibration Verification Material (CVM) is for in vitro diagnostic use in the verification of calibration of the IMMULITE C-Peptide assay on the IMMULITE 2000 systems.

The IMMULITE® SHBG Calibration Verification Material (CVM) is for in vitro diagnostic use in the verification of calibration of the IMMULITE SHBG assay on the IMMULITE 2000 systems.

The IMMULITE® Total Testosterone Calibration Verification Material (CVM) is for in vitro diagnostic use in the verification of calibration of the IMMULITE Total Testosterone assay on the IMMULITE 2000 systems.

Type of Use (Select one or both, as applicable)

Prescription Use (Part 21 CFR 801 Subpart D)  Over-The-Counter Use (21 CFR 801 Subpart C)

**PLEASE DO NOT WRITE BELOW THIS LINE -- CONTINUE ON A SEPARATE PAGE IF NEEDED.**

**FOR FDA USE ONLY**

Concurrence of Center for Devices and Radiological Health (CDRH) (Signature)

**Yung W. Chan -S**

This section applies only to requirements of the Paperwork Reduction Act of 1995.

**\*DO NOT SEND YOUR COMPLETED FORM TO THE PRA STAFF EMAIL ADDRESS BELOW.\***

The burden time for this collection of information is estimated to average 79 hours per response, including the time to review instructions, search existing data sources, gather and maintain the data needed and complete and review the collection of information. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden, to:

Department of Health and Human Services  
Food and Drug Administration  
Office of Chief Information Officer  
Paperwork Reduction Act (PRA) Staff  
PRAStaff@fda.hhs.gov

*"An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB number."*