May 31, 2024

Kenota Inc.
Martin Mann
Director of Regulatory Affairs
335 Gage Ave #1
Kitchener, Ontario N2M 5E1
Canada

Re: K231151
Trade/Device Name: Kenota 1 Total IgE, Kenota 1 (instrument)
Regulation Number: 21 CFR 866.5510
Regulation Name: Immunoglobulins A, G, M, D, and E immunological test system
Regulatory Class: Class II
Product Code: DGC
Dated: April 21, 2023
Received: April 24, 2023

Dear Martin Mann:

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 (the 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. Although this letter refers to your product as a device, please be aware that some cleared products may instead be combination products. The 510(k) Premarket Notification Database available at https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm identifies combination product submissions. 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.

Additional information about changes that may require a new premarket notification are provided in the FDA guidance documents entitled "Deciding When to Submit a 510(k) for a Change to an Existing

Device" (https://www.fda.gov/media/99812/download) and "Deciding When to Submit a 510(k) for a Software Change to an Existing Device" (https://www.fda.gov/media/99785/download).

Your device is also subject to, among other requirements, the Quality System (QS) regulation (21 CFR Part 820), which includes, but is not limited to, 21 CFR 820.30, Design controls; 21 CFR 820.90, Nonconforming product; and 21 CFR 820.100, Corrective and preventive action. Please note that regardless of whether a change requires premarket review, the QS regulation requires device manufacturers to review and approve changes to device design and production (21 CFR 820.30 and 21 CFR 820.70) and document changes and approvals in the device master record (21 CFR 820.181).

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 Part 801 and Part 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR Part 803) for devices or postmarketing safety reporting (21 CFR Part 4, Subpart B) for combination products (see https://www.fda.gov/combination-products/guidance-regulatory-information/postmarketing-safety-reporting-combination-products); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820) for devices or current good manufacturing practices (21 CFR Part 4, Subpart A) for combination products; and, if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR Parts 1000-1050.

Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to https://www.fda.gov/medical-devices/medical-device-safety/medical-device-reporting-mdr-how-report-medical-device-problems.

For comprehensive regulatory information about medical devices and radiation-emitting products, including information about labeling regulations, please see Device Advice (https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance) and CDRH Learn (https://www.fda.gov/training-and-continuing-education/cdrh-learn). Additionally, you may contact the Division of Industry and Consumer Education (DICE) to ask a question about a specific regulatory topic. See the DICE website (https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance/contact-us-division-industry-and-consumer-education-dice) for more information or contact DICE by email (DICE@fda.hhs.gov) or phone (1-800-638-2041 or 301-796-7100).

Sincerely,

Ying Mao -S

Ying Mao, Ph.D.
Branch Chief
Division of Immunology and Hematology Devices
OHT7: Office of In Vitro Diagnostics
Office of Product Evaluation and Quality
Center for Devices and Radiological Health

Enclosure

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Food and Drug Administration

Indications for Use

Form Approved: OMB No. 0910-0120
Expiration Date: 07/31/2026
See PRA Statement below.

510(k) Number *(if known)*
K231151

Device Name
Kenota 1 Total IgE
Kenota 1 (instrument)

Indications for Use *(Describe)*
The Kenota 1 Total IgE is an in vitro test system intended for semi-quantitative measurement of total IgE in human capillary whole blood on the Kenota 1 instrument. It is intended for in vitro diagnostic use as an aid in the clinical diagnosis of IgE-mediated allergic disorders in conjunction with other clinical findings, and is to be used in allergist/immunologist offices.

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)

CONTINUE ON A SEPARATE PAGE IF NEEDED.

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Dual 510(k) CLIA Waiver for Kenota 1 Total IgE: 510(k)Summary

Premarket Notification 510(k) No: k231151

Date of Summary Preparation: **May 16, 2024**

Manufacturer: Kenota Incorporated, DBA Kenota Health

1-335 Gage Ave.
Kitchener ON
N2M 5E1

Distributor: Kenota USA
TBD

Company Contact Person: **Martin Mann**
Dir. Regulatory Affairs
Kenota Inc.
1-335 Gage Ave.
(269) 207-7049
Martin@kenota.com

Device Name:
Kenota 1 Total IgE, Kenota 1 instrument

Common Name:

- Automated in-vitro semi-quantitative assay for the measurement of total IgE antibodies.

Regulator Information:

Product Code(s)	Classification	Regulation	Section Panel
DGC	Class II	21 CFR 866.5510 - Immunoglobulins A, G, M, D, and E Immunological Test System	IM - Immunology

Dual 510(k) CLIA Waiver for Kenota 1 Total IgE: 510(k)Summary

I Submission/Device Overview:

A Purpose for Submission:

Dual 510(k) and CLIA Waiver by Application (Dual Submission) for a new device

B Measurand:

Total immunoglobulin E (IgE)

C Type of Test:

Semi-Quantitative, fluorescence lateral flow immunoassay

II Intended Use/Indications for Use:

A Intended Use(s):

See Indications for Use below.

B Indication(s) for Use:

The Kenota 1 Total IgE is an in vitro test system intended for semi-quantitative measurement of total IgE in human capillary whole blood on the Kenota 1 instrument. It is intended for in vitro diagnostic use as an aid in the clinical diagnosis of IgE-mediated allergic disorders in conjunction with other clinical findings, and is to be used in allergist/immunologist offices.

C Special Conditions for Use Statement(s):

For Prescription Use Only

D Special Instrument Requirements:

Kenota 1 (instrument)

III Device/System Characteristics:

A Device Description:

The Kenota 1 Total IgE test system consists of Kenota 1 Total IgE Cartridge (reagent) and other test components, including Kenota 1 Total IgE External Controls (EC), Kenota 1 (instrument), Kenota 1 Sample Collection Kit (SCK), and Kenota 1 Developing Solution.

1. Kenota 1 Total IgE Cartridge (MKT-00006)
   - Cartridges for lateral flow immunoassay
   - Conjugate: anti-human IgE, fluorescently-labeled
   - Two cartridges provided in a single sealed pouch

2. Kenota 1 Total IgE External Controls (EC) (MKT-00007)
   - External controls at two levels (low and high)
   - 300 µL of each low and high control are provided in a 1.5 mL microcentrifuge tube
   - Recombinant human IgE-Fc
   - For single use / discarded after each external control session
   - Ready for use, provided separately

3. Kenota 1 (instrument) (MKT-00003)
   - Automated instrument with a detachable tablet screen
   - Cartridge sleeve loading up to 30 cartridges
   - Instrument auto dispenses test sample into cartridges from the Kenota 1 Sample Collection Kit
   - Instrument auto dispenses Kenota 1 Developing Solution into cartridges
   - 25 minutes runtime for the Kenota 1 Total IgE

4. Kenota 1 Sample Collection Kit (SCK) (MKT-00004)
   - Consists of a syringe assembly, lancet, blood collector, diluent collector, and diluent
   - Only for use with the Kenota 1
   - Blood collector: Minivette POCT lithium-heparin green plunger (100 µL, Sarstedt)
   - Diluent collector: Minivette POCT neutral white plunger (100 µL, Sarstedt)
   - Ready for use, provided separately

5. Kenota 1 Developing Solution (DS) (MKT-00005)
   - Phosphate buffered saline with stabilizer and preservative (500 mL)
   - Only for assays running on Kenota 1
   - Ready for use, provided separately

B Principle of Operation:

The Kenota 1 Total IgE is a lateral flow immunoassay test system that measures total IgE in human capillary whole blood on the automated instrument, Kenota 1. After an operator loads the fingerstick sample into the Kenota 1, the instrument dispenses a set amount of the fingerstick sample (4.5 µL) onto the Kenota 1 Total IgE Cartridge and adds the Kenota 1 Developing

Solution to allow the sample to flow along the membrane to the test line containing immobilized mouse anti-human IgE that captures the human IgE in the test sample. This immune complex is captured by mouse anti-(human IgE) IgG bound to the fluorescent reporter. The fluorescent test signal is directly proportional to the level of IgE in the sample. Excess Europium-antibody conjugates are captured at the control line, which consists of immobilized rat anti-mouse kappa light chain IgG.

C Instrument Description Information:

1. Instrument Name:

   Kenota 1 (instrument)

2. Specimen Identification:

   Capillary whole blood is the only specimen type for Kenota 1 and the samples are loaded into the instrument one sample at a time.

3. Specimen Sampling and Handling:

   The Kenota 1 processes fresh fingerstick whole blood samples collected in a blood collector coated with lithium heparin anticoagulant (Minivette POCT lithium-heparin green plunger (100 µL, Sarstedt)) and transferred to the syringe assembly of the Kenota 1 Sample Collection Kit (SCK) for the Kenota 1 Total IgE. The syringe assembly is manually loaded into the Kenota 1 by the operator.

4. Calibration:

   The Kenota 1 is factory calibrated. The Kenota 1 Total IgE Cartridge is factory calibrated to align directly with the 3rd International Standard for serum IgE (11/234), using a set of nine working calibrators with values assigned to 0, 2.17, 6.2, 18.6, 37.2, 93, 310, 620, and 930 kU/L.

5. Quality Control:

   Performance of the Kenota 1 Total IgE is verified with the Kenota 1 Total IgE External Controls (EC). The EC is a stabilized control material used for verifying the performance of the Kenota 1, Kenota 1 Total IgE Cartridge, and intended users' operational procedures. Results of the external control session are not interpreted by the operator but by the Kenota 1 instrument. If the external control session fails, the Kenota 1 is automatically locked out and the operator is instructed to contact Kenota Support. The external control session is required

when a new lot of Kenota 1 Total IgE Cartridge is used, or when using a new bottle of Kenota 1 Developing Solution, or a new operator is qualified, or when a monthly (every 30 days) maintenance session is performed.

IV Substantial Equivalence Information:

A Predicate Device Name:

Phadia ImmunoCAP Total IgE

B Predicate 510(k) Number:

K161899

C Comparison with Predicate(s):

Device & Predicate Device(s):	**Candidate** K231151	**Predicate** K161899
Device Trade Name	Kenota 1 Total IgE	ImmunoCAP Total IgE
General Device Characteristic Similarities		
Intended Use/Indications For Use	The Kenota 1 Total IgE is an in vitro test system intended for semi-quantitative measurement of total IgE in human capillary whole blood on the Kenota 1 instrument. It is intended for in vitro diagnostic use as an aid in the clinical diagnosis of IgE-mediated allergic disorders in conjunction with other clinical findings, and is to be used in allergist/immunologist offices.	ImmunoCAP Total IgE is an in vitro test system for the quantitative measurement of circulating total IgE in human serum and plasma. It is intended for in vitro diagnostic use as an aid in the clinical diagnosis of IgE mediated allergic disorders in conjunction with other clinical findings, and is to be used in clinical laboratories. ImmunoCAP Total IgE is to be used with the instruments Phadia 100, Phadia 250, Phadia 1000, Phadia 2500 or Phadia 5000.
Product Code	DGC	DGC
Rx or OTC	Rx Only	Same
Test Principle	Solid phase Immunofluorescence assay	Same
Assay Technology	Direct Fluorescence	Same
Analyte	Immunoglobulin E (IgE)	Same
Capture Antibody	Mouse anti-human IgE monoclonal	Same
Detection Antibody	Mouse anti-(human IgE) IgG monoclonal	Same

Device & Predicate Device(s):	**Candidate** K231151	**Predicate** K161899
Traceability	3rd International Reference Preparation (IRP) 11/234 of Human Serum Immunoglobulin E from World Health Organization (WHO)	Same
General Device Characteristic Differences		
Measurement Type	Semi-quantitative	Quantitative
Test Results	Below LoQ: <5 kU/L Very Low: 5–34 kU/L Low: 35–100 kU/L Medium: 101–200 kU/L High: 201–540 kU/L Very High: 541–900 kU/L Above Measuring Interval: >900 kU/L	kU/L
Sample Type	Fingerstick whole blood (Lithium-Heparin)	Venous serum or plasma (EDTA or Heparin)
Intended Use Environment	Allergist / immunologist offices with a Clinical Laboratory Improvement Amendments (CLIA) Certificate of Waiver.	Clinical laboratory
Operating Principle	Lateral flow immunoassay	Sponge-based immunoassay
Test Sample Volume	4.5 µL	40 µL
Detection Capability	LoD: 5 kU/L LoQ: 5 kU/L	LoD: 2 kU/L LoQ: 2 kU/L
Reportable Range	5 - 900 kU/L	2 - 5000 kU/L
Calibration	9-level multipoint calibration is performed at the manufacturing site. Lot specific calibration values are coded on the cartridge barcodes	6-level multipoint calibration is performed externally by the operator
Calibrators	0, 2.17, 6.2, 18.6, 37.2, 93, 310, 620, 930 kU/L	2, 10, 50, 200, 1000, 5000 kU/L
Controls	Two levels: Low and High	Three levels: Low, Medium, High

V Standards/Guidance Documents Referenced:

- CLSI EP05-A3: Evaluation of Precision of Quantitative Measurement Procedures; Approved Guideline—Third Edition
- CLSI EP06-Ed2: Evaluation of Linearity of Quantitative Measurement Procedures: A Statistical Approach; Approved Guideline
- CLSI EP07, 3rd Edition: Interference Testing in Clinical Chemistry

- CLSI EP17-A2: Evaluation of Detection Capability for Clinical Laboratory Measurement Procedures; Approved Guideline—Second Edition
- I/LA-20 3rd Edition (Replaces I/LA20-A3): Analytical Performance Characteristics, Quality Assurance, and Clinical Utility of Immunological Assays for Human Immunoglobulin E Antibodies of Defined Allergen Specificities - Third edition
- CLSI EP25-Ed2 (Replaces EP25-P): Evaluation of Stability of In Vitro Diagnostic Reagents; Approved Guideline.
- CLSI EP28-A3c: Defining, Establishing, and Verifying Reference Intervals in the Clinical Laboratory; Approved Guideline—Third Edition
- CLSI EP37: Supplemental Tables for Interference Testing in Clinical Chemistry

VI Performance Characteristics (if/when applicable):

A Analytical Performance:

1. Precision / Reproducibility:

Precision of the Kenota 1 Total IgE Cartridge was evaluated with four precision studies: (a) within-laboratory study for evaluation of different cartridge lots, (b) within-laboratory study for evaluation of different Kenota 1 instruments, (c) estimation of repeatability of fingerstick whole blood samples, and (d) multi-site reproducibility of controls as follows.

a. Within-laboratory imprecision for evaluation of variability of cartridge lots

Precision was evaluated according to CLSI document EP05-A3 using three lots of Kenota 1 Total IgE Cartridge on a single Kenota 1 instrument using fresh venous whole blood samples collected in lithium-heparin anticoagulant-coated blood collection tubes. In the study, total IgE was measured using the Kenota 1 Total IgE Cartridge in five replicates for each lot of cartridges, two times per day for five days (5 days x 3 lots x 2 runs x 5 replicates = 150 replicates per sample) by a single operator / instrument. The result for different components of precision is summarized below:

Sample	N	Mean (kU/L)	Repeatability		Between-Run		Between-Day		Between-Lot		Within-Laboratory	
			SD	%CV	SD	%CV	SD	%CV	SD	%CV	SD	%CV
Low	150	48.4	6.1	12.6	0.0	0.0	1.6	3.3	7.1	14.6	9.5	19.6
Medium	150	131.0	15.0	11.5	0.0	0.0	4.2	3.2	10.7	8.2	18.9	14.5
High	150	312.1	38.8	12.4	0.0	0.0	0.0	0.0	30.9	9.9	49.6	15.9
Very high	150	803.3	63.1	7.9	0.0	0.0	2.9	0.4	45.3	5.6	77.7	9.7

In addition, the table below provides semi-quantitative analysis over three cartridge lots.

Sample	N	Mean (kU/L)	< 5	5–34	35–100	101–200	201–540	541–900	> 90
Low	150	48.4	0	4.7 % (7/150)	95.3 % (143/150)	0	0	0	0
Medium	150	131.0	0	0	2.7 % (4/150)	97.3 % (146/150)	0	0	0
High	150	312.1	0	0	0	1.3 % (2/150)	98.7 % (148/150)	0	0
Very high	150	803.3	0	0	0	0	0	90.7 % (136/150)	9.3 % (14/150)

b. Within-laboratory precision study for evaluation of variability of instruments

Instrument-to-Instrument variability was evaluated using three Kenota 1 instruments with one cartridge lot using fresh venous whole blood samples collected in lithium-heparin anticoagulant-coated blood collection tubes. The study included three operators (one operator for each instrument). In the study, the total IgE concentration was measured using one lot of the Kenota 1 Total IgE Cartridge in five replicates for each instrument/operator two times per day for five days (5 days x 2 runs x 3 instruments x 5 replicates = 150 replicates per sample). The result for different components of numeric values is summarized below.

Sample	N	Mean (kU/L)	Repeatability		Between-Run		Between-Day		Between-Instrument/ Operator		Within-Laboratory	
			SD	%CV	SD	%CV	SD	%CV	SD	%CV	SD	%CV
Low	150	54.3	7.1	13.1	0.0	0.0	1.8	3.3	0.0	0.0	7.4	13.6
Medium	150	139.4	18.4	13.2	0.0	0.0	6.3	4.5	0.0	0.0	19.5	14.0
High	150	342.4	50.4	14.7	0.0	0.0	14.3	4.2	0.0	0.0	52.4	15.3
Very high	150	802.4	52.4	6.5	9.1	1.1	0.0	0.0	13.0	1.6	54.7	6.8

In addition, the table below provides semi-quantitative analysis over three cartridge lots.

Sample	N	Mean (kU/L)	< 5	5–34	35–100	101–200	201–540	541–900	> 900
Low	150	48.4	0	0.7 % (1/150)	99.3 % (149/150)	0	0	0	0
Medium	150	131.0	0	0	0	100.0 % (150/150)	0	0	0

High	150	312.1	0	0	0	0	99.3 % (149/150)	0.7 % (1/150)	0
Very high	150	803.3	0	0	0	0	0	98.7 % (148/150)	1.3 % (2/150)

c. Estimation of repeatability of Fingerstick whole blood samples

An estimate of repeatability was determined using 355 fresh fingerstick whole blood samples covering the analytical measuring interval (AMI) that were collected in the Minivette POCT lithium-heparin tubes. The study was conducted in three CLIA-waived sites in the U.S. and the testing was performed by a total of eleven (11) untrained operators, including three untrained operators at Site 1, three untrained operators at Site 2, and five untrained operators at site 3. Two different operators each collected a separate fingerstick whole blood from the same patient and tested the sample on two (2) or three (3) Kenota 1 instruments at each site with a single lot of Kenota 1 total IgE Cartridge. Variability of two fingerstick numerical results was calculated for each patient in five semi-quantitative intervals. The SD for each semi-quantitative interval was calculated as the SD averaged over patients from the interval. The results of the repeatability evaluation are presented in the table below.

Range (kU/L)	Sample (N)	Mean (kU/L)	SD	%CV
5 – 34	117	17.9	1.9	10.6
35–100	86	63.1	5.5	8.7
101–200	57	142.7	14.0	9.8
201–540	67	335.7	28.3	8.4
541–900	28	702.6	50.5	7.2
Entire Range (5-900)	355	162.9	13.5	8.3

d. Multi-site Reproducibility

Multi-site Reproducibility was evaluated at three CLIA-waived sites using a single lot of Kenota 1 Total IgE External Controls tested. The low and high controls of the ECs were tested by three operators per site in two external control sessions per day on seven different days at each site using a single lot of Kenota 1 total IgE Cartridge to obtain 126 replicates (3 sites x 3 operators x 2 EC sessions x 7 days) per control. The result for different components of numeric values is summarized below.

Control	N	Mean (kU/L)	Between-Run		Between-Day		Between-Operator		Between-Site		Total	
			SD	%CV	SD	%CV	SD	%CV	SD	%CV	SD	%CV
Low	126	34.0	3.9	11.4	1.0	2.8	1.2	3.4	0.0	0.0	4.1	12.2
High	126	259.5	26.2	10.1	11.2	4.3	9.7	3.8	0.0	0.0	30.1	11.6

2. Linearity:

Linearity was evaluated according to CLSI document EP06-2nd by testing eleven (11) dilution levels that cover the analytical measuring interval (AMI) of the Kenota 1 Total IgE. The test samples were prepared by pooling the high and low human lithium-heparin venous whole blood samples. Each sample dilution was measured in one run with 15 replicates. The Kenota 1 Total IgE was found to be linear at 11 levels spanning the semi-quantitative categories as shown in the table below.

Sample	Expected Numerical Value (kU/L)	Expected Category (kU/L)	< 5	5–34	35–100	101–200	201–540	541–900	>900
1	981	>900						6.7% (1/15)	93.3% (14/15)
2	787	541-900						100% (15/15)	
3	590	541-900					13.3% (2/15)	86.7% (13/15)	
4	393	201-540					100% (15/15)		
5	197	101-200					100% (15/15)		
6	99	35-100			6.7% (1/15)	93.3% (14/15)			
7	50	35-100			100% (15/15)				
8	26	5-34		100% (15/15)					
9	13	5-34		100% (15/15)					
10	7	5-34		100% (15/15)					
11	4	<5	53.3% (8/15)	46.7% (7/15)					

3. Interference and Cross-reactivity:

a. Interference

Interference was evaluated according to CLSI document EP07, 3rd Edition and EP37 by testing human lithium-heparin venous whole blood samples at two IgE levels (low and high) for potential interfering substances. Each test sample was spiked with a known amount of potentially interfering substances and analyzed at a minimum of six replicates. The recovery was calculated by comparing test samples spiked with the potential interferents to control samples spiked with the same volume of diluents. When interference was detected at the initial single dose testing, a dose-response assessment was conducted to identify the amount of the interfering substance with <±10% difference between the test and control sample. No significant interference was observed (≤ ±10% difference between the control and spiked sample) for Kenota 1 Total IgE Cartridge up to the concentrations of the potential interfering and cross-reacting substances tested as shown in the tables below.

i) Endogenous Interferents

Substance	Substance concentration showing no interference / cross reactivity (<10% bias)	Sample level	% Interference (95% CI)
Bilirubin (conjugated)	475 µmol/L	Low	-6.5 (-15.79, 2.89)
		High	9.5 (-5.14, 24.16)
Triglycerides	1500 mg/Dl	Low	1.2 (-13.52, 15.98)
		High	6.6 (-12.9, 26.09)
Rheumatoid Factor*	450 IU/Ml	High	6.8 (-6.51, 20.01)
Albumin	6 g/Dl	Low	-1.8 (-15.5, 11.88)
		High	-2.9 (-18.97, 13.15)
Creatinine	15 mg/Dl	Low	1.0 (-10.5, 12.8)
		High	-8.8 (-18.92, 1.36)
Oxalic Acid	90 µmol/L	Low	0.9 (-15.42, 17.23)
		High	-9.2 (-15.66, -2.8)
IgA	800 mg/Dl	Low	-9.5 (-17.18, -1.83)
		High	-3.5 (-11.84, 4.79)
IgD	320 IU/Ml	Low	-7.6 (-24.57, 9.38)

		High	-7.4 (-29.43, 14.68)
IgG	3200 mg/Dl	Low	-6.6 (-15.28, 2.03)
		High	-4.9 (-10.93, 1.09)
IgM	460 mg/Dl	Low	9.6 (0.98, 18.02)
		High	5.7 (-19.86, 8.38)
HAMA	30 ng/Ml	Low	5.0 (-2.69, 12.54)
		High	1.8 (-8.38, 12.07)
Hemoglobin	1000 mg/Dl	Low	4.3 (-14.51, 23.09)
		High	-7.5 (-23.33, 8.27)

* Rheumatoid Factor showed a significant interference (≥ 10% bias) at the lowest amount of 112.5 IU/Ml when the low sample was tested.

ii) Exogenous interferents

Substance	**Highest substance concentration under therapeutic treatment**	**Substance concentration showing no interference / cross reactivity (<10% bias)**	**Sample level**	**% Interference and 95% Confidence Interval**
Acetaminophen	344 µmol/L	1030 µmol/L	Low	-1.1 (-19.85, 17.68)
			High	-0.1 (-7.2, 6.98)
Acetylsalicylic Acid	55.5 µmol/L	167 µmol/L	Low	-2.9 (-14.44, 8.83)
			High	-6.3 (-24.69, 12.11)
Ascorbic Acid	99.4 µmol/L	298 µmol/L	Low	-2.5 (-10.77, 6.07)
			High	-3.0 (-21.03, 15.11)
Caffeine	185 µmol/L	556 µmol/L	Low	2.3 (-11.37, 16.06)
			High	6.6 (-7.9, 21.11)
Cetirizine	3.73 µmol/L	11.2 µmol/L	Low	5.3 (-4.6, 15.4)
			High	1.9 (-5.06, 8.75)

Diphenhydramine	1.01 µmol/L	3.03 µmol/L	Low	-9.1 (-16.2, -2.14)
			High	7.3 (0.08, 14.46)
Ethanol	2 g/L	6 g/L	Low	3.3 (-9.6, 16.2)
			High	-8.9 (-17.5, –0.3)
Fexofenadine	0.764 µmol/L	2.29 µmol/L	Low	-0.5 (-14.31, 13.26)
			High	7.6 (-11.75, 26.94)
Gentisic Acid	32.4 µmol/L	97.3 µmol/L	Low	1.6 (-8.57, 12.01)
			High	-8.4 (-20.55, 3.72)
Heparin	110 units/Dl	330 units/Dl	Low	-3.8 (-21.54, 14.02)
			High	-2.8 (-18.29, 12.73)
Omalizumab*	54 µg/Ml	N/A		

* Omalizumab (XOLAIR) showed a significant interference (≥ 10% bias) for low and high IgE samples at all concentrations between 25 µg/Ml to 100 µg/Ml.

b. Cross-reactivity
The cross-reactivity of Kenota 1 Total IgE Cartridge with other immunoglobulin isotypes was evaluated in the 'Endogenous interferents' above.

4. Assay Reportable Range:

The claimed analytical measuring interval (AMI) for the Kenota 1 Total IgE is 5.0 kU/L to 900 kU/L.

5. Traceability, Stability, Expected Values (Controls, Calibrators, or Methods):

i. Traceability:
The Total Immunoglobulin E (IgE) working calibrators are traceable to the primary reference material WHO 3rd International Standard Human IgE (11/234).

ii. Kenota 1 Total IgE Test Cartridge (Reagent) Stability:
A real-time stability study for the Kenota 1 Total IgE Cartridge was performed in accordance with the CLSI guideline CLSI EP25-Ed2. Three human plasma samples (low, medium, and high) were tested using three lots of Kenota 1 Total IgE Cartridge paired

with Kenota 1 Developing Solution on four Kenota 1 instruments (1 to 3 instruments per storage time point) to evaluate assay performance of the cartridge at multiple time points. As a worst-case scenario, each reagent lot was prestressed to environmental test conditions that simulated potential winter (-20°C) and summer (40°C) transport profiles for 24 hours and then stored at 21°C through the duration of the stability period. Results support the claimed reagent shelf-life stability for 5 months at 2–8°C.

iii. Kenota 1 Total IgE External Controls (EC) Stability:

A real-time stability study for the EC was performed in accordance with the CLSI guideline CLSI EP25-Ed2. Two EC samples (low and high) were tested using three lots of EC with one lot of the Kenota 1 Total IgE Cartridge on one Kenota 1 at multiple time points. Each EC lot was stored at -20°C (recommended storage condition) or under prestressed to environmental test conditions at 18–25 °C for 24 hours and then stored at -20°C through the duration of the stability period. Results support the claimed EC shelf-life stability for 5 months at -20 °C.

iv. Kenota 1 Sample Collection Kit (SCK) and Kenota 1 Developing Solution (DS) Stability:

A real-time stability study for SCK paired with DS was performed in accordance with the CLSI guideline CLSI EP25-Ed2. Two human venous whole blood samples (low and high) were tested using four lots of SCK and four lots of DS with one lot of the Kenota 1 Total IgE Cartridge on one Kenota 1 instrument at multiple time points. Two EC-DS lot pairs were stored at 31°C (recommended storage condition at 15–30 °C) or under prestressed to environmental test conditions that simulated potential winter (-20°C) and summer (40°C) transport profiles for 24 hours and then stored at 31°C through the duration of the stability period. Results support the claimed SCK and DS shelf-life stability for 5 weeks at 15–30 °C.

6. <u>Detection Limit:</u>

The Limit of Blank (LoB), Limit of Detection (LoD), and Limit of Quantitation (LoQ) studies were conducted in accordance with the CLSI guideline EP17-A2.

i. Limit of Blank (LoB)
The LoB was evaluated with three different venous whole blood samples with total IgE concentrations <3 kU/L and one surrogate whole blood matrix with no IgE used as the individual blank samples. Each blank /very low sample was tested in ten replicates on two Kenota 1 instruments for 3 days (one run per day), using two lots of Kenota 1 Total IgE Cartridge to obtain a total of 120 replicates (4 samples x 10 replicates x 3 days = 120 replicates) per reagent lot. The LoB was estimated as the 95th percentile of the

measurements for each of the lots tested and determined to be 1.5 kU/L and 1.9 kU/L for the two lots of Kenota 1 Total IgE Cartridge. The LoB of Kenota 1 Total IgE Cartridge was determined 1.9 kU/L.

ii. Limit of Detection (LoD) / Limit of Quantitation (LoQ)
The LoD and LoQ were determined using four individual low venous whole blood samples. Each LoD sample was tested in ten replicates, for each of the two lots of Kenota 1 Total IgE Cartridge, one run per day for three days to obtain a total of 30 replicates per sample in each reagent lot. The LoD was calculated as the LoB + 1.645/ (1 - [1/4(B-K)]) x SD of the replicates for the low level samples as 4.4 kU/L and 3.9 kU/L for the two lots of Kenota 1 Total IgE Cartridge. The LoQ was calculated to be 4.7 and 5.0 kU/L for the two lots of Kenota 1 Total IgE Cartridge. The claimed LoD is 5 kU/L and the claimed LoQ is 5 kU/L.

7. Assay Cut-Off:

Not applicable

8. Accuracy (Blood Collector / Instrument):

The performance of blood collector was evaluated by recovery of test samples run on the Kenota 1 instrument. Fresh venous whole blood was collected using two lots of Minivette POCT Lithium-heparin, 100 µL (Sarstedt). Five blood collectors in each lot were used to collect venous whole blood and prepare two test samples (low at ~ 50kU/L and high at ~ 450 kU/L) for measuring recovery of IgE. The Standard IgE (3rd International Standard for serum IgE, 11/234) was spiked into the test samples and the recovery was analyzed by the 'measured increase of IgE' over 'expected increase of IgE'. The recovery bias was < ± 10% across two blood collector lots for the samples run on the Kenota 1.

9. Carry-Over:

Control and test carryover conditions were evaluated across four Kenota 1 instruments that tested a venous whole blood sample in the 'very low' category (11.4 kU/L) immediately after testing a sample in 'above measuring interval' category (1875 kU/L measured by the predicate). The IgE level was measured in five consecutive cycles of testing 'above measuring interval sample – very low sample' for each instrument. There was no carry-over between tests run on four instruments.

B Comparison Studies:

1. Method Comparison with Predicate Device:

A method comparison study was performed in accordance with the CLSI guideline EP09c. 3rd Ed. The subjects were recruited as representative of the intended use population, for patients with eczema or atopy coming in for regular appointments to the allergy specialty care clinics. Individuals with skin damage, burns or scars at the site of venipuncture on both arms were excluded. Patients provided fresh fingerstick whole blood collected by a total of eleven untrained operators at three CLIA-waived sites in the US using Minivette POCT lithium-heparin tubes for the Kenota 1 Total IgE System. The same patients provided venous whole blood collected by phlebotomists for the comparator at the same three CLIA-waived sites in the US. A total of 411 eligible subjects aged 6 to 80 years participated in the study. Of these 411 subjects, there were 50 subjects excluded / missed due to withdrawal or failed fingerstick / venipuncture specimen collection. There were additional four (4) subjects with invalid test results due to human or instrument errors. Therefore, 357 samples were used for comparison analysis. The semi-quantitative analysis for the test result categories is summarized in the table below where cells in green color present allowable candidate test categories and the cells in the orange color present "erroneous" categories (Limits of Erroneous Results, LER) where a difference between the candidate category and the comparator values is more than ±1 category.

Kenota 1 Total IgE (kU/L)	**ImmunoCAP Total IgE (kU/L)**										
	<5	**5-27.5**	**27.6-41.4 Near C1**	**41.5-80.3**	**80.4-121 Near C2**	**122-159**	**160-241 Near C3**	**242-431**	**432-649 Near C4**	**650-900**	**>900**
<5	2										
5-34	8	95	12	2							
35-100		3	17	49	15	2					
101-200				1	19	24	10	1			
201-540						1	16	32	13	1	1
541-900								1	9	8	11
>900											4
Total	10	98	29	52	34	27	26	34	22	9	16
Percent in ATE	100.0% (10/10)	96.9% (95/98)	100.0% (29/29)	94.2% (49/52)	100.0% (34/34)	88.9% (24/27)	100.0% (26/26)	94.1% (32/34)	100.0% (22/22)	88.9% (8/9)	93.8% (15/16)
Percent in ATE	Low range 96.8% (183/189)				Middle range 96.6% (84/87)			High range 95.1% (77/81)			

	95%CI: (93.2%; 98.5%)	95%CI: (90.3%; 98.8%)	95%CI: (88.0%; 98.1%)
Percent in ATE	96.4% (344/357) 95%CI: (93.9%; 97.9%)		
Percent in LER	0.0% (0/357) 95%CI: (0.0%; 1.1%)		

In addition, of these 357 samples used for semi-quantitative analysis above, 339 samples were used for regression analysis based on the test results within the AMI of both the Kenota Total IgE test and the comparator. Results of a weighted Deming regression analysis for numeric values of the test samples are summarized in the table below.

Comparison	Sample Range (IU/mL)	N	Slope (95% CI)	Intercept (95% CI)	Correlation Coefficient (r)
Kenota 1 System and Kenota 1 Total IgE Assay vs ImmunoCAP Total IgE	5.1-824.1	N = 339	1.03 (1.00, 1.06)	1.10 (0.49, 1.66)	0.95

2. Matrix Comparison:

Not applicable; lithium-heparin capillary whole blood is the only sample type.

C Clinical Studies:

1. Clinical Sensitivity:

Not applicable

2. Clinical Specificity:

Not applicable

3. Other Clinical Supportive Data (When 1. and 2. Are Not Applicable):

See Method Comparison

D Clinical Cut-Off:

Not applicable

E Expected Values/Reference Range:

A reference interval study was performed in accordance with CLSI guideline EP28-A3c using 117 fingerstick samples (ranged 8 to 79 years of age) collected from adult (N = 95, at 22 to 79 years of age) and pediatric (N = 22, at 8 to < 22 years) volunteer donors from populations in North Carolina, Virginia, and Minnesota, USA. All test samples were collected from individuals with no known allergies or eczema and listing no allergy medications on Donor Information Forms, with two replicates per sample. The reference interval was determined by calculating 2.5th and 97.5th percentiles using the EP28-A3c. The results are summarized in the table below. The 90% confidence intervals for the upper and lower limits were determined by bootstrap resampling methodology. The results are summarized in the table below.

Age	Sample (N)	Median (kU/L)	IgE Level (kU/L)
8 to < 22 years	22	99.8	<5 to 509
22 to 79 years	95	26.8	<5 to 695

* FDA Guidance document, Providing Information about Pediatric Uses of Medical Devices (2014)

IgE reference intervals are significantly influenced by age, sex, geographic location, microflora of the gastrointestinal tract, diet of the population, as well as environmental factors such as climate change.

F Other Supportive Instrument Performance Characteristics Data:

The Kenota 1 Total IgE is intended to be used at Point-of-Care (POC) sites, including allergist / immunologist offices with a Clinical Laboratory Improvement Amendments (CLIA) Certificate of Waiver. Operational limits of the Kenota 1 Total IgE were tested in the following series of studies:

1. Temperature and Relative Humidity

   A study was performed to evaluate whether performing tests using a Kenota 1 and reagents at a wide range of temperature and relative humidity (RH) conditions could lead to erroneous results. If the room temperature and/or humidity conditions exceed the instrument's limit (17–28 °C, 10–90% humidity), the instrument's failure alert check is triggered. The instruments and cartridges were exposed to seven test conditions (see Test condition 2) to 8)

below) and the test was performed using two fresh venous whole blood samples (~ 45 kU/L and ~450 kU/L) in 10 replicates:

1) Control condition: 22 °C, RH 37%
2) Test condition: 17 °C RH 6%
3) Test condition: 17 °C RH 88%
4) Test condition: 28 °C RH 11%
5) Test condition: 27 °C RH 86%
6) Test condition: 16 °C RH 32%
7) Test condition: 29 °C RH 22%
8) Test condition: 22 °C RH 96%

The test results were within ± 5% bias in Test Condition 2), 3), and 4) compared to Control condition 1) above. The run was not initiated when the instrument detected the room temperature and/or humidity conditions exceeding the instrument's limit (17–28 °C, 10–90% humidity) in Test condition 6), 7), and 8) above and the tablet screen displayed an error message (e.g., 'Room Temperature Too High'). This study demonstrates that the instrument reports valid results only when the testing room temperature and/or humidity conditions are within the instrument's operating specification (17–28 °C, 10–90% RH) based on the instrument's failure alert check.

2. Instrument on vibrating surface

A study was performed to evaluate whether performing tests using the Kenota 1 instrument in environments subject to vibrations leads to erroneous results. A fresh venous whole blood sample (~ 200 kU/L) was tested in 24 replicates each on a surface with no/minimal environmental vibrations and a surface with extreme environmental vibrations. An unbalanced centrifuge was run at 3000 RPM. A vibration meter was used to detect the vibrations for 1 minute at specific locations that were measured at 0.33g on the top of the centrifuge, 0.09g on the table next to the centrifuge, 0.07g on the side of the instrument, and 0.16g on the top of the instrument. This study demonstrates the test is unaffected (< ±5% bias) by running a test on a vibrating surface.

3. Instrument on tilted surface

A study was performed to evaluate whether performing tests using the Kenota 1 instrument in environments subject to tilted surface leads to erroneous results. If the tilted surface beyond its specification limit is detected, the instrument's failure alert check is triggered. A fresh venous whole blood sample (~ 175 kU/L) was tested in a control condition (no tilt / 0 degree, 24 replicates), slight tilt (2 degrees, 24 replicates), moderate tilt (4 degrees, 3 replicates), and high tilt (8 degrees, 3 replicates). The test results were < ±5% bias on

front/back and left/right tilt at ±2 degrees. The run was not initiated when the instrument detected a front/back and left/right tilt at ±4 degrees and ±8 degrees, showing an error message "Tilt Error" on the tablet screen. This study demonstrates that the test reports valid results only when the instrument is placed up to 2-degree tilted angle.

4. Sub-optimal lighting conditions

A study was performed to evaluate whether operators perform testing under varying lighting conditions. A fresh venous whole blood sample was (~ 200 kU/L) tested in 48 replicates in each of the following conditions:

1) Control condition: office lighting (≅ 500 lux)
2) Test condition: direct sunlight (≅ 10000 lux)
3) Test condition: dark (≅ 5 lux)

The test results were < ±5% bias in Test Condition 2), and 3) compared to Test condition 1) above. This study demonstrates that the test operators were able to perform the tests in various lighting conditions.

5. Mechanical impact on instrument

A study was performed to evaluate whether mechanical impacts (100g object dropped five times from 30 cm) to the Kenota 1 instrument could lead to biased results. A fresh venous whole blood sample (~ 220 kU/L) was tested in 24 replicates in each of the following conditions:

1) Control condition: no mechanical impact
2) Test condition: mechanical impact during run initialization failure alert checks
3) Test condition: mechanical impact during sample dispensing
4) Test condition: mechanical impact during cartridge imaging

The test results were < ±5% bias in Test Condition 2), 3), and 4) compared to Control condition 1) above. This study demonstrates that the test is unaffected by mechanical impacts on the instrument during different stages of testing.

6. Samples with air bubbles

A study was performed to determine the ability of the Kenota 1 instrument's failure alert check to detect the presence of air bubbles in the sample after the instrument mixes the sample in the SCK. Air bubbles introduced into the SKC syringe are typically resolved by the sample mixing performed by the instrument and unresolved bubbles are assessed by a failure

alert check, preventing SCK with large bubbles from beginning a run. If air bubbles exceeding the size limit are detected by the instrument, the failure alert check is triggered. A fresh venous whole blood sample (~ 194 kU/L) was tested in 24 replicates with (Test condition) and without (Control condition) induced air bubbles. For the test condition, air bubbles were intentionally introduced until two sample syringes passed the run initialization failure alert checks (approximately 1-4 µL air bubble size). The test results were < ±5% bias in Test condition compared to Control condition. This study demonstrates that accurate results can be obtained if operators introduce air bubbles in the test sample up to approximately 4 µL size.

7. Different cartridge positions within the sleeve

A study was performed to determine if the test results are affected by the location within the stack of cartridges in the sleeve. Each sleeve holds up to 15 Kenota 1 Total IgE Cartridges. A fresh venous whole blood sample (~ 200 kU/L) was used for the test using cartridges in three different location categories (Low: position 1-5, Middle: position 6-10, High: position 11-15). The sample was tested in 12 runs with 5 replicates per run that generated a total of 60 replicates per location category (e.g., 60 results from Low category). The average of test results was < ±5% bias in comparison by the location category (Low, Middle, and High). This study demonstrates that the test results are unaffected by different cartridge positions within the sleeve.