



**UC 1 Calibration Verification / Linearity Test Kit**

**INTENDED USE**

**VALIDATE UC 1** Calibration Verification / Linearity Test Kit solutions are intended for *in vitro* diagnostic use in the quantitative determination of linearity, calibration verification and verification of reportable range in automated, semi-automated and manual instrument systems for the following analytes in urine: **SET 1** contains uric acid (UA). **SET 2** contains ethyl alcohol (ETOH), sodium (NA), potassium (K), chloride (CL), glucose (GLU), urine urea nitrogen (UUN) and urine total protein (UTP).

Each test set consists of one bottle each of Levels 1 through 5. Each set also contains one bottle of zero. Each bottle contains 3.0 milliliters. There exists a linear relationship among Levels 1 through 5.

**SUMMARY**

Each **VALIDATE UC 1** Calibration Verification / Linearity Test Kit contains purified chemicals and materials in a human urine matrix. Multiple levels are provided to establish the relationship between theoretical and actual performance of each of the included analytes. The **VALIDATE UC 1** Calibration Verification / Linearity Test Kit will assist in the documentation of linearity, calibration verification and verification of linear range required by many inspection agencies. The solutions will also provide assistance when troubleshooting instrument systems, reagent problems and calibration anomalies.

**REAGENTS**

**Reactive Ingredients:**

Purified chemicals and constituents of human source for UA, ETOH, NA, K, CL, GLU, urea and protein in a human urine matrix.

**Nonreactive Ingredients:**

Preservatives and stabilizers.

**Precautions and Warnings:**

*For In Vitro Diagnostic Use*

Disposal of all waste material should be in accordance with local guidelines.

**WARNING: Potentially Biohazardous**

Human source material is considered potentially biohazardous. Material of human origin used in the manufacture of this test kit was tested at the donor level using FDA approved methods and found to be non-reactive for HBsAg and to antibodies to HCV and HIV-1/2. Because no test method can offer complete assurance that infectious agents are absent, these specimens should be handled and treated as potentially infectious.

**STORAGE AND STABILITY**

**VALIDATE UC 1** Calibration Verification / Linearity Test Kits are stable until the expiration date printed on the storage container when stored at 2° to 8°C and handled according to instructions.

**PREPARATION**

Prior to use, remove the **VALIDATE UC 1** Calibration Verification / Linearity Test Kit from storage and allow

to come to room temperature (18° to 25°C). Invert gently several times before dispensing.

To maximize stability, it is recommended that exposure to room temperature be minimized. Tightly cap opened bottles and return to 2° to 8°C immediately after dispensing.

Discard any solutions that appear to have gross bacterial contamination.

The **VALIDATE UC 1** Calibration Verification / Linearity Test Kit should be treated in the same manner as patient samples. If dilutions or pre-treatment are required as part of the testing procedure, follow the manufacturer's instructions.

**ASSAY**

Analyze each level in replicates. If following the CLSI EP6 guidelines for linearity, use a random analytical sequence to assay each level.

**CALCULATION OF RESULTS**

**VALIDATE UC 1** Calibration Verification / Linearity material is prepared in a manner such that an equal distance (delta) exists between each consecutive level. This dilution scheme is consistent with the CLSI EP6 recommendation for preparing linearity sets.

Two examples for calculating the theoretical values of Levels 1 through 5 are provided below.

**Example 1:**

Choose two consecutive levels and calculate the delta between the recovered values. The following example demonstrates the use of the delta between Levels 2 and 3 to calculate the theoretical value for Levels 1, 4 and 5:

**Mean Recovered Values**

Level 1	51
Level 2	164
Level 3	275
Level 4	388
Level 5	501

Using Level 2 and Level 3 recovered values to calculate the Delta, the above data produces the following:

Level 3 – Level 2 = Delta, or (275 - 164 = 111)

Level 1 Theoretical = Level 2 Recovered - Delta, or (164 - 111 = 53)

Level 4 Theoretical = Level 3 Recovered + Delta, or (275 + 111 = 386)

Level 5 Theoretical = Level 4 Theoretical + Delta, or (386 + 111 = 497)

Using the delta between Level 2 and Level 3, the theoretical value for each level would be:

Level	Theoretical (x-axis)	Recovered (y-axis)
1	53	51
2	164	164
3	275	275
4	386	388
5	497	501

NOTE: The user can select the calculated delta between any two consecutive levels to calculate the theoretical values. Typically, the user should choose

an area of recovery known to be linear for the method being studied.

**Example 2:**

Theoretical values can be determined using the recovered values for Levels 1 and 5. Using this method, the following formulas apply:

Level 2 = 0.75 \* (Level 1) + 0.25 \* (Level 5)

Level 3 = 0.5 \* (Level 1) + 0.5 \* (Level 5)

Level 4 = 0.25 \* (Level 1) + 0.75 \* (Level 5)

Using the recovered values for Level 1 (51) and Level 5 (501), the following applies:

Level 2 = 0.75 \* (51) + 0.25 \* (501) = 163.5

Level 3 = 0.5 \* (51) + 0.5 \* (501) = 276

Level 4 = 0.25 \* (51) + 0.75 \* (501) = 388.5

Level	Theoretical (x-axis)	Recovered (y-axis)
1	51	51
2	163.5	164
3	276	275
4	388.5	388
5	501	501

After the theoretical values are calculated, for each analyte plot the expected (Theoretical) value on the x-axis versus the Recovered value on the y-axis using standard linear graph paper. If the system is linear, the plot should approximate a straight line. The point at which the line is no longer straight can be used to determine the limit of linearity or the reportable range.

Data reduction is available from Maine Standards Company (see worksheet for instructions). Commercially available linear regression software may also be used. The software should provide data point display and x-y graphical presentation. Linear regression should be interpreted using standard statistical analysis and the results should be compared with the instrument manufacturer's claims for linearity or with individual laboratory performance requirements. The degree of acceptable non-linearity is an individual judgment based on methodology, clinical significance and medical decision levels of the test analyte.

**LIMITATIONS**

**VALIDATE UC 1** Calibration Verification / Linearity Test Kit solutions are not intended for use as routine quality control materials or as calibration materials.

These solutions are not intended for use with Direct ISE methods.

**EXPECTED VALUES**

**VALIDATE UC 1** Calibration Verification / Linearity Test Kits are manufactured such that a linear relationship exists among Levels 1 through 5. The expected value of Level 0 is zero, however, in some instances a non-zero result may be obtained. Level 0 can be used to make dilutions of Level 1 to obtain a result lower than Level 1, if needed.

**TYPICAL VALUES**

Actual results obtained may vary depending on instrumentation, methodology and assay temperature. Results may also be dependent on the

accuracy of the instrument/reagent system calibration. The degree of acceptable non-linearity is an individual judgment based on methodology, clinical significance and medical decision levels of the test analyte.

Typical Values by Level 701bc						
Analyte	Units	1	2	3	4	5
<b>Set 1</b>						
UA	mg/dL	5	29	53	76	100
<b>Set 2</b>						
CL	mmol/L	15	86	158	229	300
ETOH	mg/dL	5	154	303	451	600
GLU	mg/dL	0	175	350	525	700
K	mmol/L	2	77	151	226	300
NA	mmol/L	10	83	155	228	300
UTP	mg/dL	6	42	78	114	150
UUN	mg/dL	50	288	525	763	1,000

Typical Values by Level 701db						
Analyte	Units	1	2	3	4	5
<b>Set 1</b>						
UA	mg/dL	0	25	50	75	100
<b>Set 2</b>						
CL	mmol/L	10	90	170	250	330
ETOH	mg/dL	0	75	150	225	300
GLU	mg/dL	0	125	250	375	500
K	mmol/L	1	51	101	150	200
NA	mmol/L	5	79	153	226	300
UTP	mg/dL	6	67	128	189	250
UUN	mg/dL	0	375	750	1,125	1,500

Typical Values by Level 701e						
Analyte	Units	1	2	3	4	5
<b>Set 1</b>						
UA	mg/dL	0.2	25	50	75	100
<b>Set 2</b>						
CL	mmol/L	10	70	130	190	250
ETOH	mg/dL	10	133	255	378	500
GLU	mg/dL	2	189	376	563	750
K	mmol/L	1.5	26	51	75	100
NA	mmol/L	10	70	130	190	250
UTP	mg/dL	6	55	103	152	200
UUN	mg/dL	2.9	1,402	2,801	4,201	5,600

Typical Values by Level 701f						
Analyte	Units	1	2	3	4	5
<b>Set 1</b>						
UA	mg/dL	2.2	27	51	76	100
<b>Set 2</b>						
CL	mmol/L	20	103	185	268	350
ETOH	mg/dL	0	125	250	375	500
GLU	mg/dL	2.16	182	361	541	720
K	mmol/L	1	38	76	113	150
NA	mmol/L	20	103	185	268	350
UTP	mg/dL	4	53	102	151	200
UUN	mg/dL	2.8	1,402	2,801	4,201	5,600

Typical Values by Level 701vt						
Analyte	Units	1	2	3	4	5
<b>Set 1</b>						
UA	mg/dL	5.5	29	53	76	100
<b>Set 2</b>						
GLU	mg/dL	0	163	325	488	650
K	mmol/L	0	44	88	131	175
NA	mmol/L	0	63	125	188	250
UTP	mg/dL	0	50	100	150	200
UUN	mg/dL	0	630	1,260	1,890	2,520

**ORDERING INFORMATION**

**ORDER NO.:** 701

**VALIDATE UC 1**

Calibration Verification / Linearity Test:

Set 1: 6 x 3mL

Set 2: 6 x 3mL

For technical assistance or to place an order, please call:

800-377-9684 or

207-892-1300

Fax 207-892-2266

[www.mainstandards.com](http://www.mainstandards.com)

Please allow 5 to 7 days for delivery.

Maine Standards Company

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