



## INTENDED USE

VALIDATE THY 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: **THY Set:** cortisol (COR), triiodothyronine (T3), thyroxine (T4) and human thyroid stimulating hormone (TSH). **FT4 Set:** free thyroxine (FT4). The THY Set also contains free triiodothyronine (FT3) as an element of the Total T3 component.

Each test set consists of one bottle each of Levels 1 through 5. There exists a linear relationship among Levels 1 through 5 for each set.

## SUMMARY

Each **VALIDATE** THY Calibration Verification / Linearity Test Kit contains purified materials in a solution of human serum. Multiple levels are provided to establish the relationship between theoretical and actual performance of each of the included analytes. The **VALIDATE** THY 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:

**THY Set:** COR, T3, T4 and human TSH in a human serum matrix.

**FT4 Set:** T4 in a human serum 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 or CE approved methods and found to be nonreactive for HBV, HCV and HIV. 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** THY Calibration Verification / Linearity Test Kits are stored at -10° to -25°C. **Do NOT store in a frost-free freezer.** Test kits are stable until the expiration date printed on the bottle and storage container when handled according to instructions.

## PREPARATION

Prior to use, remove the **VALIDATE** THY 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 -10° to -25°C immediately after dispensing.

Discard any solutions that appear to have gross bacterial contamination.

The **VALIDATE** THY 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 guideline for linearity, use a random analytical sequence to assay each level.

## CALCULATION OF RESULTS

**VALIDATE** 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 Theoretical = 0.75 \* (Level 1) + 0.25 \* (Level 5)

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

Level 4 Theoretical = 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 Theoretical = 0.75 \* (51) + 0.25 \* (501) = 163.5

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

Level 4 Theoretical = 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 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 LGC Maine Standards. 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 nonlinearity is an individual judgment based on methodology, clinical significance and medical decision levels of the test analyte.

## LIMITATIONS

**VALIDATE** THY 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 on systems employing reflectance spectroscopy.

## EXPECTED VALUES

**VALIDATE** THY Calibration Verification / Linearity Test Kits are manufactured such that a linear relationship exists among Levels 1 through 5. The reagent manufacturer's recommended diluent 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 nonlinearity is an individual judgment based on methodology, clinical significance and medical decision levels of the test analyte.

Typical Values by Level 901re						
Analyte	Units	1	2	3	4	5
Free T4	ng/dl	0.023	1.96	3.90	5.83	7.77
Cortisol	µg/dL	0.0	15.9	31.7	47.6	63.4
Free T3	ng/dL	FT3 is a component of Total T3. Results may vary.				
Total T3	ng/mL	0.195	1.77	3.35	4.93	6.51
Total T4	µg/dL	0.420	6.5	12.7	18.8	24.9
TSH	µIU/mL	0.005	25	50	75	100

## ORDERING INFORMATION

ORDER NO.: 901re

### VALIDATE THY

Calibration Verification / Linearity Test Kit:

THY Set: 5 x 3 mL

FT4 Set: 5 x 2.5 mL

Contact Information:

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