

## Result Interpretation

It is preferred for quantitative results to be determined using commercially available software for ELISA evaluation using a 4-parameter curve fit. Alternatively, a semi-log curve fit can be used if 4-parameter software is not available. A spreadsheet that will perform the curve fit and sample concentration calculations is available upon request. Please contact Beacon for further details.

To ensure the validity of the results, please adhere to the following:

- Ensure QC criteria are met.
- The concentration of Dextran in a sample is determined by comparing the average sample absorbance to the standard curve. This value must then be multiplied by the dilution factor used.
- In the event that the average absorbance of the sample is lower than the highest calibrator, further dilute the sample extract in laboratory quality distilled or deionized water to fit into the standard curve and retest alongside the calibrators. Sample results must be multiplied by the total dilution factor used.

## Technical Assistance

For questions regarding this kit or for additional information about Beacon products, contact us.

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## Safety

Stop Solution is 1N hydrochloric acid. Handle with care. To receive complete safety information on this product, contact Beacon Analytical Systems, Inc., and request Safety Data Sheets.

## General Limited Warranty

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## Intended Use

The Beacon Dextran Plate Kit is an immunoassay for the detection of Dextran in fresh cane and beet juice samples. This product is intended for research use only.

## Principles

Dextran HRP Enzyme Conjugate is pipetted into the test wells followed by the Calibrators and the Sample Extract(s). A soluble polyclonal Dextran antibody solution is then added to the test wells to initiate the reaction. During an incubation, Dextran and Dextran HRP Enzyme Conjugate compete for binding to the Dextran antibody which is in turn immobilized on the test wells. Following the incubation, the wells are washed to remove any unbound Dextran and Dextran HRP Enzyme Conjugate. After washing, a colorless substrate is added to the wells and any bound enzyme conjugate will convert the substrate to a blue color. Following an incubation, the reaction is stopped with the addition of Stop Solution and the amount of color in each well is measured. The color of the unknown sample is compared to the color of the calibrators and the Dextran concentration of the sample is derived.

## Reagents and Materials Provided

|           |   |
|-----------|---|
| 1 Unit    | Plate containing 12 test strips of 8 wells each that are vacuum sealed in an aluminized pouch with a desiccant. |
| 6 X 2 mL  | Vials of Dextran Calibrators (0, 0.4, 0.8, 1.6, 3.2 and 6.4 ppm).   |
| 1 X 8 mL  | Bottle of Dextran HRP Enzyme Conjugate.   |
| 1 X 8 mL  | Bottle of Dextran Antibody.   |
| 1 X 14 mL | Bottle of Substrate.  |
| 1 X 14 mL | Bottle of Stop Solution.  |
| 1 Unit    | Packet of Wash Concentrate (dilute prior to use).   |

## Reagents and Materials Required but Not Provided

- Pipette(s) with disposable tips capable of dispensing the required volume(s).
- Multichannel pipette(s) (8 channels) with disposable tips capable of dispensing the required volume(s) (recommended if running more than two strips at once).
- Laboratory quality distilled or deionized water.
- Reagents and materials for sample preparation.
- Personal protective equipment.
- Paper towels or equivalent absorbent material.
- Wash bottle.
- Timer.
- Microtiter plate or strip reader capable of reading absorbance at 450 nm.

### Kit Handling Notes and Precautions

- Read the product brochure in its entirety prior to use.
- The kit, in its original packaging, can be used until the end of the month indicated on the box label.
- Do not use reagents after their expiration date.
- Store all kit components at 4°C to 8°C (39°F to 46°F) when not in use.
- Reagents should be brought to room temperature, 20°C to 28°C (62°C to 82°F), prior to use. Avoid prolonged (> 24 hours) storage at room temperature.
- Do not freeze kit components or expose them to temperatures greater than 37°C (99°F).
- Running Calibrators and Samples in duplicate will improve assay precision and accuracy.
- Precise transfer of samples and reagents by using a calibrated pipette that is capable of dispensing the required volume is critical to obtain proper assay results.
- When running more than two strips at once, the use of a multi-channel pipette is recommended when adding the Antibody, Substrate and Stop Solution.
- All procedural steps should be completed without interruption. Ensure all reagents, materials and equipment are ready at the appropriate time.
- Each reagent is optimized for use in the Beacon Dextran Plate Kit. Do not substitute reagents from any other manufacturer into the test kit. Do not combine reagents from other Beacon Dextran Plate Kits with different lot numbers.
- Do not reuse test wells.
- Dilution or adulteration of reagents or samples not called for in the procedure may result in inaccurate results.
- Damage to or obstruction of the optical surface may cause unsatisfactory results.

### Specificity

The percent cross reactivity (based on IC50) of Dextran T-40 with other Dextran Molecular Weights (DMW) in addition to other various congeners is shown in the table below.

| Compound    | Sigma Catalog Number | Percent Cross-Reactivity |
|-------------|----------------------|--------------------------|
| (DMW) T-40  | 31389                | 100                      |
| (DMW) T-6   | 31388                | 26                       |
| (DMW) T-100 | 01984                | 121                      |
| (DMW) T-450 | 31392                | 107                      |
| Corn Starch | S5296                | < 0.01                   |
| Levan       | L8647                | < 0.01                   |

### Sensitivity

The Limit of Detection (LOD) and Limit of Quantitation (LOQ) of the assay for juice samples diluted 1:10 in laboratory quality distilled or deionized water are 0.519 and 1.714 ppm respectively.

### Wash Solution Preparation

1. Measure 1 L of laboratory quality distilled or deionized water and transfer to a clean container with a tight-fitting lid.
2. Transfer the contents of Wash Concentrate packet to the container, swirl to mix.
3. Transfer the Wash Solution to a wash bottle to use in the assay.

### Sample Preparation

Fresh Juice: (Dilution Factor: 10)

1. Centrifuge the juice samples for 5 minutes at 12,000 X g to clarify.
2. Prepare a 1:10 dilution by diluting 100 µL of the clarified juice sample with 900 µL of laboratory quality distilled or deionized water and mix thoroughly and use in the assay.

### Assay Procedure

1. Allow kit components and the sample extract(s) to reach room temperature prior to running the test.
2. Place the appropriate number of test wells into a holder. Be sure to re-seal unused test wells in the zip-lock bag with the desiccant to limit exposure to moisture.
3. Dispense **50 µL of Enzyme Conjugate** into each well.
4. Dispense **50 µL of Calibrators and Sample Extract(s)** into the appropriate wells. Be sure to use a clean pipette tip for each solution to avoid cross contamination.
5. Dispense **50 µL of Antibody** into each well.
6. Gently shake the wells for 30 seconds using a back-and-forth motion and incubate for **30 minutes** at room temperature.
7. Decant the contents of the wells into an appropriate waste container. Fill the wells to overflowing with the Wash Solution and then decant. Repeat this wash step four times for a total of five washes. Following the last wash, tap the inverted wells onto absorbent paper to remove excess Wash Solution.
8. Dispense **100 µL of Substrate** into each well.
9. Gently shake the wells for 30 seconds using a back-and-forth motion and incubate for **30 minutes** at room temperature.
10. Dispense **100 µL of Stop Solution** into each well in the same order of addition as the Substrate.
11. Gently shake the wells for 30 seconds using a back-and-forth motion.
12. Carefully wipe the optical surface with a soft, lint-free wipe. Measure and record the absorbance (Optical Density; OD) of each well at 450 nm using a plate or strip reader within 10 minutes of stopping the assay. If the reader has dual wavelength capability, read at 450 minus 605 or 650 nm.
13. Dispose of used test wells in an appropriate waste container.

### Quality Control (QC) Criteria

- The correlation coefficient ( $R^2$ ) of the calibration curve, analyzed using a 4-parameter logistic regression, must be  $\geq 0.99$ .
- The average absorbance of the zero calibrator replicates must be  $\geq 1.0$ .
- The average absorbance of calibrator replicates must have a coefficient of variation (%CV)  $< 15\%$ .
- The average absorbance of sample replicates must have a coefficient of variation (%CV)  $< 20\%$ .