

**CUSTOMER SERVICE**

Neogen Customer Assistance and Technical Service can be reached by using the contact information below. Training on this product, and all Neogen test kits, is available.

**MSDS INFORMATION AVAILABLE**

Material safety data sheets (MSDS) are available for this test kit, and all of Neogen's Food Safety test kits, at [www.neogen.com](http://www.neogen.com), or by calling Neogen.

**WARRANTY**

Neogen Corporation makes no warranty of any kind, either expressed or implied, except that the materials from which its products are made are of standard quality. If any materials are defective, Neogen will provide a replacement product. Buyer assumes all risk and liability resulting from the use of this product. There is no warranty of merchantability of this product, or of the fitness of the product for any purpose. Neogen shall not be liable for any damages, including special or consequential damage, or expense arising directly or indirectly from the use of this product.

*Read instructions carefully before starting test*

# Reveal 3-D Mustard Test

**TESTING KITS AVAILABLE FROM NEOGEN**

**Natural toxins**

- Aflatoxin, DON, ochratoxin, zearalenone, T-2/HT-2 toxins, fumonisin, histamine

**Foodborne bacteria**

- *E. coli* O157:H7, *Salmonella*, *Listeria*, *Listeria monocytogenes*, *Campylobacter*, *Staphylococcus aureus*

**Sanitation**

- ATP, yeast and mold, total plate count, generic *E. coli* and total coliforms, protein residues

**Food allergens**

- Almonds, crustaceans, eggs, gliadin, hazelnut, lupine, milk, mustard, peanuts, sesame, soy, walnut

**Genetic modification**

- CP4 (Roundup Ready®)

**Ruminant by-products**

- Meat and bone meal, feed



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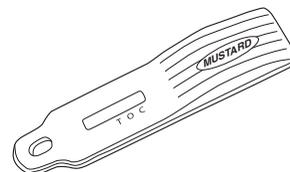
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**INTRODUCTION AND INTENDED USE**

The Reveal® 3-D Mustard Test is uniquely designed with three lines of detection and can be used virtually anywhere to screen environmental swabs and rinses for the presence of mustard. The test's 3-D technology ensures greater reliability with screening than ever before.



The Reveal 3-D Mustard Test is intended for use only in an industrial food manufacturing/preparation context or for food labelling enforcement testing. Because of the problems of adequately sampling and extracting mustard, it is not suitable for the testing of foods to be consumed in the home or in a restaurant by allergic individuals. The test detects significant (low parts per million, or ppm) levels of mustard content in rinses and environmental swabs.

**DETECTION LIMIT**

The test uses highly specific antibodies to detect mustard protein. Mustard can be detected from various surfaces using the provided environmental swabs or from rinses.

Utilizing the environmental swabs supplied, levels of 20 µg/ 100 cm<sup>2</sup> of mustard on surfaces can be detected.

When analyzing rinses, mustard residues are detectable at a level of 5-10 ppm. The presence of cleaners and sanitizers can affect limit of detection in rinses.

**CROSS-REACTIVITY**

This test cross-reacts with canola and rapeseed due to their similarity in structure to mustard protein.

**TEST PERFORMANCE**

The Reveal 3-D Mustard Test has undergone rigorous validation to evaluate the specificity, sensitivity, robustness and intra- and inter-batch variability of the test method on rinses and environmental swabs.

**SAMPLE COMPATIBILITY**

The Reveal 3-D Mustard Test is designed to detect mustard on environmental surfaces and in rinses. Although every effort has been made to validate as many variables as possible, there may be some sample types that are not suitable for testing.

Users should perform in-house matrix-specific spike recovery validation work in conjunction with a validated laboratory assay (e.g., Veratox) to help confirm Reveal 3-D Mustard Test results. This procedure will highlight any problematic matrices encountered.

The validation of certain food ingredients may be applicable for the Reveal 3-D test format. However, it is recommended a more broadly inclusive test method, such as Veratox for Mustard Allergen, be used for food ingredients. Please contact a Neogen representative or distributor for additional details.

**MATERIALS PROVIDED**

The Reveal 3-D Mustard Test pack (Neogen item 8405) includes:

1. An instruction leaflet
2. 1 foil pouch, containing 10 Reveal 3-D Mustard Test devices
3. 10 sachets containing extraction solution type 7
4. 10 sample tubes and caps
5. 10 individually packaged sterile swabs with break-off tips

**SAMPLING TECHNIQUE**

**Clean-in-place rinse water**

As only a small amount of material is required for the Reveal 3-D Mustard Test, it is important to test a representative portion of liquid.

**Environmental swabbing**

The swabs supplied are intended to be used for the collection of environmental samples from which the presence of mustard can be tested. This method can be used to validate the adequacy of cleaning and/or to identify problem areas (e.g., unwanted buildup of mustard in processing equipment).

**Food samples**

Contact a Neogen representative or distributor for more information on testing food samples for mustard.

**PRECAUTIONS**

1. For environmental testing in an industrial food manufacturing/ preparation, or labeling enforcement context only.
2. Do not use any part of the test beyond the expiration date.
3. Do not open the foil pouch until just before use.
4. Always store the kit between 2–8°C (35–46°F). Avoid freezing.
5. Ensure the foil bag is tightly sealed after removal of a device.
6. Bring kit to room temperature 18–30°C (64–86°F) prior to use.

**TEST STORAGE / SAMPLE STABILITY**

Store the Reveal 3-D Mustard Test kit between 2–8°C (35–46°F). The kit should be used within the expiration date stated on the outer label. Extracted samples should be used within **3 hours** of extraction.

**LIMITATIONS**

A negative test from a surface or rinse cannot exclude the possibility the food contains mustard since it may be distributed unevenly on the surface or in the rinse and may be below the detection limit of the test with that specific sample.

The Reveal 3-D Mustard Test is qualitative and only should be used as a preliminary screen for the presence of mustard. The validity of results obtained with the test preferably should be viewed in conjunction with data from a quantitative assay, such as Veratox for Mustard Allergen.

**RINSE SAMPLING**

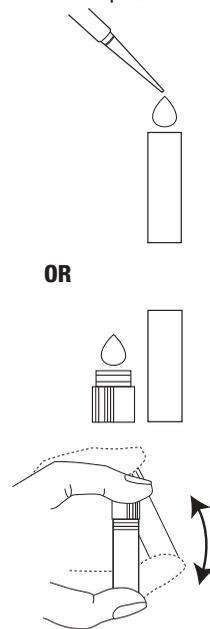
For each sample to be tested, remove the following from refrigeration and allow to equilibrate at room temperature before use (**20–30 minutes** out of refrigerator):

1. 1 sample tube
2. 1 Type 7 Extraction Buffer Sachet
3. 1 Reveal 3-D Mustard Test device (in foil pouch)

1. Carefully tear/cut off the top of the clear Type 7 Extraction Buffer Sachet and add the entire contents to the sample tube.

2. Add 1 mL sample to the sample tube. If a pipette is unavailable, 1 mL may be crudely estimated by half-filling a white sample tube cap. **NOTE:** Test results may be less accurate.

3. Secure the white cap and shake for **1 minute**.



**SWAB SAMPLING**

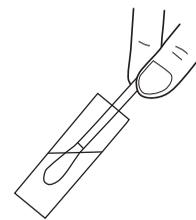
For each sample to be tested, remove the following from refrigeration and allow to equilibrate at room temperature before use (**20–30 minutes** out of refrigerator):

1. 1 sample tube
2. 1 Type 7 Extraction Buffer Sachet
3. 1 Reveal 3-D Mustard Test device (in foil pouch)
4. 1 sterile swab

1. Carefully tear/cut off the top of the Type 7 Extraction Buffer Sachet and add the entire contents to the sample tube.

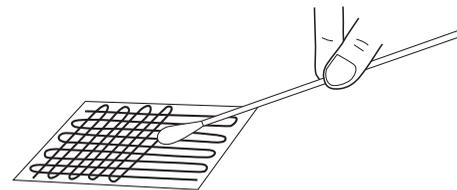
2. Estimate a swabbing area of approximately 10 x 10 cm. Alternatively use the swab to collect samples of contamination from problem areas (e.g., processing equipment).

3. Gather the sample with the swab, using one of the following methods:



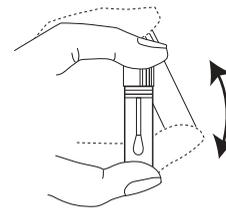
**For dry surfaces:** Remove a sterile swab from the packaging and wet with extraction buffer in the sample tube. Swab a 10 x 10 cm area by using a crosshatch technique revolving the swab on the surface. Repeat this swabbing procedure using movements at right angles to those used in the first swabbing.

**For wet surfaces:** Remove a sterile swab from the packaging and swab a 10 x 10 cm area by using a crosshatch technique revolving the swab on the surface. Repeat this swabbing procedure using movements at right angles to those used in the first swabbing. Do not moisten swab prior to use.



4. Place the swab in the buffer in the sample tube and carefully break off the moistened end at the prescored mark so that it remains in the tube.

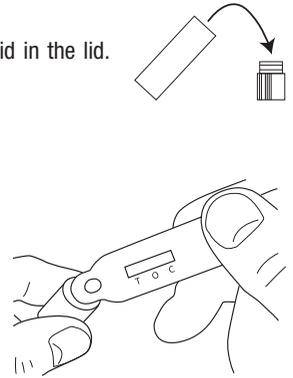
5. Secure the cap of the sample tube, taking care to ensure the stem does not prevent the tube from being properly sealed. Shake for **1 minute**.



**SAMPLE TESTING**

1. Remove the lid and fill it with the liquid from the tube. Any froth should remain in the tube.
2. Dip the head of the Reveal 3-D device into the liquid in the lid. Ensure the cavity is saturated with the liquid.
3. Leave the cavity saturated until liquid is seen running in the test window.
4. Place device on a flat surface and allow test to develop for **5 minutes**.

**NOTE:** It is essential to place the device flat on a level surface as soon as the liquid has entered the test window to stimulate flow through the device.

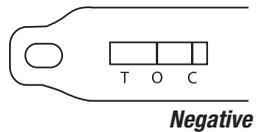


**READING RESULTS**

Liquid will flow into the test window. Read the result **5 minutes** after dipping.

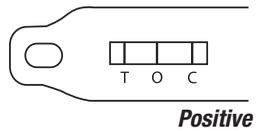
**Negative result**

No line at position T (test): Level of mustard undetectable. (See limitations section.)



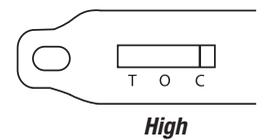
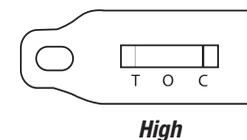
**Positive result**

Any intensity of line at position T (test): Level of mustard above detection limit.



**High results**

No line is visible at position O (overload) and a line is faintly visible or absent at position T: Sample is overloaded with mustard.



**Invalid results**

If no line appears at position C (control), then the test is invalid.