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## Determining seed germination using a staining method (Vitascop) Type Easi-Twin

### Application:

Vitascop Easi-Twin is a device for determining seed germination using a staining method.

### Principle:

In viable seeds, oxidoreductases and the corresponding coenzymes reduce the colorless 2,3,5-triphenyltetrazolium chloride to red-colored formazan.

### Procedure:

A counted sample of 100 seeds is cut longitudinally in a Grain Cutter and placed into cuvettes with a solution of 2,3,5-triphenyltetrazolium chloride (1 g of 2,3,5-triphenyltetrazolium chloride dissolved in 100 ml of water). The cuvettes with the halved seeds are inserted into the Vitascop and the test is started. During the test, a vacuum pump is automatically activated to create negative pressure in the cuvettes, and at the same time the Vitascop maintains a temperature of 40 °C in the cuvettes for 10 minutes. After 10 minutes, the Vitascop acoustically signals the end of the test. The cuvettes with the halved seeds are removed from the Vitascop and the stained seeds are counted.

### Calculation and Evaluation:

Germinable seeds are those with a strongly or weakly stained embryo, or those in which at least two-thirds of the embryo surface is stained. The staining ranges from light to deep pink. Non-germinating seeds have less than two-thirds of the embryo surface stained, or are white, or yellow to orange. The result is expressed as a whole-number percentage.



Vitascop Easi-Twin

Grain Cutter

### Common values according to the standard are:

**Quality Class I** – at least 97% (3 seeds out of 100 unstained)

**Quality Class II** – at least 95% (5 seeds out of 100 unstained)

**Quality Class III** – at least 92% (8 seeds out of 100 unstained)

### Technical parameters of the device:

- Two independently programmable chambers for cuvette placement
- For each chamber, time, temperature, and vacuum can be set independently
- Temperature range: 30 to 69 °C
- Time setting: 0 to 99.99 minutes
- Control accuracy: 0.5 °C
- Reproducibility: 0.5%
- Vacuum: 18.5 mm Hg
- Power supply: 230 V / 50 Hz, 150 W
- Weight: 5.5 kg
- Dimensions: 40 × 30 × 30 cm (depth × width × height)

### Scope of Delivery:

- Vitascop Easi-Twin + manual
- Cuvettes + grain holder

### **Accessories (not included in the delivery):**

- Grain Cutter for longitudinal splitting of grains

### **Main advantages and applications:**

- The device operates automatically.
- Speed: The test, including sample preparation and evaluation, takes up to 20 minutes.
- Calibration capability.
- High accuracy: Ideal for laboratories with an established ISO 9001/9002 quality system.
- Long-term experience: We have been manufacturing Vitascope for more than 20 years, during which time we have produced over 200 units. Our Vitascope are used by large companies such as Cargill and Soufflet, as well as by small malt houses and breeding institutes.

### **Frequently Asked Questions (FAQ):**

#### **Why is the staining method advantageous for determining germination?**

Because compared to classical methods (e.g., the hydrogen peroxide method or germinative energy determination), it is a very fast test.

#### **Where can 2,3,5-triphenyltetrazolium chloride be purchased?**

2,3,5-triphenyltetrazolium chloride is supplied by companies specializing in chemical distribution, such as Merck or Thermo Fisher Scientific, or you can order it directly from us.

#### **Where can I purchase the device for longitudinal splitting of grains?**

The device for longitudinal splitting of grains is manufactured by our company under the name Grain Cutter.