





## Pasteurization units in the processed package

### 1. Definition: Machine and criteria

One important parameter of a tunnel pasteurizer is the accuracy of the pasteurization units (PU) in the processed package.

For all actions the relevant safety instructions must be strictly adhered to.

#### Further related documents:

- Electronic thermograph user manual
- DIN 8784

### 2. Inspection

#### 2.1 Scope

Detection of pasteurization units in pasteurized packages by means of an electronic PU thermograph.

#### 2.2 Apparatus

Electrical PU measuring system.

The recommended accuracy of the measurement system should be in following range:

Temperature:  $\pm 0.5^{\circ}\text{C}$  or better. In a measurement range from  $0^{\circ}\text{C}$  to  $100^{\circ}\text{C}$ .

Frequency of measurement: minimum 60 cycles per minute.

The data storage should be minimum 120 readings.

A visual inspection of the used measurement devices by a person is necessary.



### 2.3 Procedure

To detect the PU, always use an electronic PU thermograph with a high measuring accuracy. The device should have two channels to measure the temperature in the package and the spray temperature of the tunnel pasteurizer zones.

The measuring probe has to be adjusted to the reference point for PU calculation: 10 mm for cold spot or 1/3 of filling height (DIN8784), measured from inner bottom surface of the package, located on the vertical centreline of the container.

The filling height should be the same as indicated in the bottle's reference drawing.

The measuring should always be executed with the same bottle or by using a standard bottle which has the same diameter, weight etc. as the bottles in production.

The calculation of the PU in the tunnel pasteurizer and in the chosen measuring device has to be done in the same way and with the same equation.

#### PU formula for beer:

$$PU_{\text{beer}} = z [\text{min}] \cdot 1,393^{(T [^{\circ}\text{C}] - 60^{\circ}\text{C})}$$

#### PU formula for juice:

$$PU_{\text{juice}} = z [\text{min}] \cdot 1,259^{(T [^{\circ}\text{C}] - 80^{\circ}\text{C})}$$

T = temperature in degree celsius

z = time in minutes

For measuring a testing fluid with the same characteristics as the product, e.g. water but without CO<sub>2</sub>, is recommended.

The infeed temperature has to be the same as under production conditions.



### 3. Sampling

To check the layout PU values, the measuring has to take place at nominal machine capacity without stoppages during the complete passage.

#### 3.1 Calculation

The calculation is automatically done by the measuring device. The temperatures and the time are recorded in the memory of the thermograph and the related PU are calculated. The results can be shown on a computer after the measuring.

#### 3.2 Results and data sheets

Free

### 4. Evaluation and Documentation

#### 4.1 Evaluation

The pasteurization units recorded by the measuring device at nominal machine capacity have to be the same as those set in the control unit of the tunnel pasteurizer.

PU (Range min) \_\_\_\_\_ PU Actual detected \_\_\_\_\_ PU (Range max) ·

#### 4.1 Documentation

PU are o.k.

PU are not o.k.

Name and signature of inspector: \_\_\_\_\_