

Specifications

Production: Process for producing *PIEtec* cork stoppers by individual moulding

Size specifications ⁽¹⁾:

Length (mm)	Nominal value \pm 0.50
Diameter (mm)	Nominal value \pm 0.30
Chamfer	<i>PIEtec</i> 2: 2 mm <i>PIEtec</i> 3: 1.5 mm <i>PIEtec</i> 5: 1.5 mm <i>PIEtec</i> Prestige: 1.5 mm
Granulates	<i>PIEtec</i> 2: 1.5 / 3.0 mm <i>PIEtec</i> 3: 0.5 / 2.5 mm <i>PIEtec</i> 5: 0.5 / 2.5 mm <i>PIEtec</i> Prestige: 0.5 / 2.5 mm

Control points:

1. Humidity ⁽²⁾	6.0% \pm 2.0
2. Specific weight ⁽¹⁾	285 kg/m ³ \pm 25
3. Resistance to boiling water ⁽³⁾	Absence of disaggregation
4. Sensory analysis ⁽⁵⁾	Neutral
5. Capillarity ⁽⁵⁾	< 2 mm
6. Residual peroxide ⁽⁴⁾ ⁽⁵⁾	< 0.2 mg/cork stopper
7. Residual solids ⁽⁵⁾	< 2.5 mg/cork stopper (Untreated cork stoppers) < 1.5 mg/cork stopper (Treated cork stoppers)
8. Extraction force ⁽⁶⁾	30 daN \pm 5
9. Compression force ⁽⁷⁾	100 \pm 30 daN
10. Torsion ⁽⁸⁾	Angle Momentum Shear stress
	> 35° > 17 daN.cm > 6 daN/cm ²
11. Liquid seal capability ⁽⁹⁾	100% \leq 2,5 bar
12. 2,4,6 - TCA ⁽⁵⁾	<i>PIEtec</i> 2: < 1.5 ng/L <i>PIEtec</i> 3: < 1 ng/L <i>PIEtec</i> 5: < 0.8 ng/L <i>PIEtec</i> Prestige: < 0.8 ng/L
	PCA TeCA TBA
	< DL < DL < DL

Standards:

⁽¹⁾ NP 4351 / NP 2803-1	⁽²⁾ NP 4351 / NP 2803-02	⁽³⁾ NP 4351 / NP 2803-7
⁽⁴⁾ SYSTECODE	⁽⁵⁾ Internal Method	⁽⁶⁾ NP 4351 / NP 2803-4
⁽⁷⁾ NP 2803-3	⁽⁸⁾ NP 4351 / NP 2803-6	⁽⁹⁾ NP 2803-5



PIEtec

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Manufacturing process

Grupo Piedade uses the latest technologies available in the cork industry to produce a new generation of cork stoppers, *PIEtec*.

PIEtec is a technical cork stopper obtained by individual moulding, using 0.5 to 3 mm granulates. As a result, it is more homogeneous, ensuring proper and uniform behaviour at the level of mechanical performance, specifically with regard to elasticity, compression force, resistance to boiling water and liquid seal capability.

All products used in producing *PIEtec* comply with FDA requirements.

In order to fulfil all customer demands, Grupo Piedade focuses on three priorities:

- 1) Organoleptic control (risk limited to organoleptic deviations resulting from the presence of TCA)
- 2) Mechanical properties
- 3) Visual appearance

TCA control

PIEtec presents TCA at levels guaranteed to be lower than 1.5 ng/L, thanks to:

- **Raw material (Cork):** in the production of *PIEtec* cork stoppers, the raw material comes from cork exclusively selected, bought and processed by Grupo Piedade.
- **Steam treatment:** the granulates are disinfected using a continuous steam or water system, which allows the reduction of the residual TCA values.
- **Control of TCA levels by GC-MS:** Grupo Piedade relies on its own laboratory and quality control systems. Representative samples at each production phase are analysed by GC-MS.

Mechanical properties

PIEtec's individual moulding process allows for a good distribution of the granulates, which guarantees:

- A compact and uniform structure of the cork stopper's body
- Homogeneous density and mechanical properties
 - a) Uniform behaviour of the cork stopper, whether during the bottling process or at extraction
 - b) Absence of capillarity
- The control techniques at the factory, for washing and treating the cork stopper's surface, limits the presence of dust on the final product.

Visual appearance

The densimetric tables for selecting the particles allow for a uniform and homogeneous profile to be obtained. The size of the granulates used (from 0.5 to 3 mm) and the use of the individual moulding process ensure a compact visual appearance with the possibility of carrying out a specific customisation on the final product.

Positioning the cork stopper

The period for preserving still wines using *PIEtec* cork stoppers is 24 to 60 months.