MANUAL
FOR THE CORRECT USE
OF SPARKLING WINE CORKS
Pressure resistance of the sparkling wine cork

For bottling sparkling wines -and, more recently, beer as well- the closure most often used is the so-called “mushroom” cork, for the typical shape it assumes after being in the bottle. The mushroom cork allows preservation over the years of the internal pressure in the bottle, a performance made possible thanks to expertise gained over a long period and to continuous research applied to this closure. Contrary to what many believe about the mushroom cork, its blockage against escape of gas from the bottle is the effect of the external portion of the cork (the crown section), the seal that this particular section is able to create on the top opening of the bottle. It is necessary then to study the behavior and functioning of the agglomerated section of the cork, which has a higher and more consistent density compared to the natural cork section in contact with the wine.
Corking problems and possible causes

EXCESSIVE INSERTION OF CORK

The excessive insertion of the cork into the bottle neck causes defects, most of them quite serious, depending on the degree of over-insertion. For the size commonly used for sparkling wines (48x30.5mm), the ideal inserted length from the bottle rim is 18-20mm before application of the wire hood and 21-23mm following application.

We define insertion of the cork as excessive when, after application of the hood, the cork is at a depth of 25-26mm, or even farther, from the bottle rim. Excessive insertion can also occur with use of a bottle with an opening that is too wide.

PROBLEM

Extraction problems due to scarce contact area available on the head of the cork, or to significant radial force exercised by the cork on the interior neck of the bottle.

RECOMMENDED STEPS

• Check the length of the insertion rod of corkscrew
• Check pressure of hood applicator
• Select bottle with internal neck diameter appropriate to type of cork used
INSUFFICIENT INSERTION OF CORK

There are generally several causes for insufficient penetration depth of the cork, including poor calibration of the corker or hood applicator, moving up of the cork between the moment of insertion and that of hood application, excessive bottle pressure, and excessive fill, with consequent insufficient air space between wine and cork.

RECOMMENDED STEPS

• Check the perfect alignment of bottle beneath jaws of corker

SLANTED-BASE CORK

Fig. 7 shows a common problem encountered in corking. The causes can be traced to poor alignment of the bottle neck to the axis of the corker, to non-consistent compression of the cork before insertion, or even to a bottle with a defective neck, that is, off-centre with respect to the bottom or oval in shape.

PROBLEM

• Difficulty in insertion • Rapid loss of gas • Loss of wine • Oxidation of wine • Extraction difficulty due to partial loss of lubrication coating on cork • Cork fragments in wine (possible foaming) • Aesthetic defect

RECOMMENDED STEPS

• Check the perfect alignment of bottle beneath jaws of corker
**Pinched Edge or Loss of Part of the Cork During Insertion**

This defect is due to poor adjustment of the corkscrew for several reasons, such as insufficient diameter of cork grip in the corkscrew, too-early release by the compression jaws (jaws closing out-of-sync with insertion of cork), incompatibility of centring mechanism with bottle type, or malfunction or poor adjustment of bottle support plate in the corkscrew.

**Problem**
- Difficulty of insertion
- Difficulty of extraction
- Cork fragments in wine
- Aesthetic defect

**Recommended Steps**
- Check diameter of jaws grip, which should be between 15 and 16mm
- Use a centring plate appropriate to the bottle
- Check elasticity of counterthrust spring beneath corkscrew

**Creased Cork**

The appearance of length-wise creases in the cork is caused by wear or by incorrect sliding of certain components of the cork compressor.

**Problem**
- Rapid loss of gas
- Loss of wine
- Oxidation of wine
- Difficult extraction (due to loss of internal pressure)

**Recommended Steps**
- Check functioning status of compression jaws and ensure that they close properly (possibly replace jaws)
HOOD APPLICATION DEFECTS

If the hood is properly applied (fig. 10), the cork will be straight and aligned with the bottle axis and the hood will be well anchored to the bottle, with the bottom cinch wire taut and tight-fitting, so that the bottom rings of the attachment wires close up tight under the edge of the bottle’s raised neck ring.

Fig. 11 illustrates another situation, in which insufficient hood applicator pressure on the head of the cork does not allow for good positioning of the hood rings under the neck band, resulting in a precarious anchoring of the hood, which in turn could be partially or wholly compromised by various conditions, such as settling or vibrations affecting the hood or increased pressure in the bottle due to temperature, for example during transportation.

<table>
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<tr>
<td>• Check the correct functioning pressure of the hood applicator</td>
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Visible defects in the cork after extraction from the bottle

In addition to the already-mentioned problems related to over-insertion, insufficient insertion, slanted-base corks, and pinched corks, uncorking a bottle can also reveal the defects listed below.

**“Nail-shaped” Cork**

<table>
<thead>
<tr>
<th>PROBABLE CAUSES</th>
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<tbody>
<tr>
<td>• Over-compression and destruction of the elastic memory of the cork</td>
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<tr>
<td>• Excessively-long horizontal storage of the corks</td>
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<td>• Under-pressure at moment of corking</td>
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<tr>
<th>SOLUTIONS</th>
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<tbody>
<tr>
<td>• Check proper functioning of compression jaws</td>
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<td>• Store bottle in vertical position</td>
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**Greenwood**

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<thead>
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<td>• Defect in the cork, due to non-compact cellular structure</td>
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**Disc Breakage**

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<td>• Defect in cork, e.g., a dry growing year</td>
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<td>• Defect of construction</td>
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<td>• Excessive compression by jaws at the moment of insertion</td>
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What to tell the cork producer

It is important to furnish one’s closure producer with information that will help to confirm the appropriateness of the closure selected for the wine to be packaged.

- Level of pressure at bottling;
- Type of bottle used (it is best practice to supply the closure producer with at least 3 sample bottles so that the interior diameter can be checked);
- Bottle storage method (upright, immediately horizontal, horizontal only at the moment of packaging, etc.);
- Particular transport conditions of the finished wine (e.g., in no-refrigerated trucks, or for long distance transportation).

Recommendation for the use of corks

- Check the proper functioning of saturation or evacuation system;
- Ensure that the diameter of the grip of the compression jaws is between 15mm and 16mm; the diameter must absolutely be no larger;
- Ensure that the compression jaws, at the moment of closing, form a perfectly smooth surface so as not to crease the closures;
- Ensure that the star wheel and centering guides of the corker are perfectly aligned and centered with respect to the compression jaws;
- Respect the filling levels indicated on the bottom of the bottle, e.g., 75cl 3 90mm = 90mm of space between the wine and the rim opening;
- Check the fill level of the wine at 20°C;
- Keep the bottles in a vertical position to preserve the elastic memory of the cork and its shape after extraction;
- Store corked bottles in a cool place (recommended at 10°C-18°C);
- For sparkling wine corks with discs, length of insertion should be between 21mm and 23mm, while those without discs should be between 20mm and 22mm.

Instructions for cork storage

- Keep the cartons of corks in a cool, clean, and dry place, ideally at temperatures between 10°C and 25°C and a humidity between 40% and 70%. If corks are stored below 10°C, acclimatize them for at least 24 hours at the recommended temperatures;
- Do not store corks in areas containing materials made of treated wood, e.g., treated pallets or roofs, to prevent transfer of olfactorily-active molecules;
- Avoid contact with extraneous liquids or odors;
- Open only just prior to use. In case of partial use, re-seal the bags hermetically;
- Avoid contact with bare hands, to prevent microbial contamination of the corks.
Some considerations on cleanliness

All of the production stages between storage of cartons and the corking operation itself present risks of microbial contamination of the corks, a problem that is too often undervalued. It is necessary, then, to avoid any contamination of the corks, delivered to the cellar in hermetically-sealed bags, during storage or in the stages of corking.

Particular attention must be paid to monitoring the relative humidity in the storage areas, since levels between 80% and saturation encourage the growth of molds, whose presence on the corks, together with residues of chlorinated compounds of various origins (e.g., sanitation of tanks or work areas) and phenols (derived from the lignin naturally present in the cork) can promote the formation of TCA.

In addition, the presence of TCA has been detected in non-bottled wines, that is, with no contact with cork, but nevertheless containing specific microflora, in addition to residues of chlorinated compounds. This demonstrates once again the necessity of carefully washing and sanitizing in the cellar.

Molds are not the only invisible enemy present in the cellar, however; contact of the corks with unclean surfaces can cause contamination of the wine, even with some yeasts (above all the dreaded *Brettanomyces*), microorganisms that are SO₂ resistant and sometimes so harmful that they can develop even in the bottle, and bacteria potentially responsible for post-bottling alteration.

To prevent these kinds of problems, it is enough to follow some simple precautions, such as:

- Sanitary conditions in the means of transport of the corks from the producer to the cellar;
- Precautions during the unloading process of the corks into the cellar;
- Perfect hygienic, temperature and humidity conditions for the cork storage areas;
- Limited storage of corks before use, since longer periods can alter humidity and optimum microbiological conditions;
- Appropriate disinfection of all cellar surfaces the corks may come in contact with.
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