



**AMORIM**

**Achieving the best seal for your wine**

**Presentation to winemaking students  
Adelaide University  
17 October 2001**

# Wine and cork an enduring partnership



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## THE CORK PRODUCER

Producing high-  
performance wine  
closures

## THE WINEMAKER

Choosing and using cork  
for best performance

## 1. Why use cork?

## 2. Producing high-performance corks

- ¥ Production process
- ¥ Quality control
- ¥ Research and development

## 3. Choosing and using cork for best performance

- ¥ Selecting, ordering, storing
- ¥ Inserting the cork
- ¥ Storing and transporting bottled wine
- ¥ Maintaining corking equipment

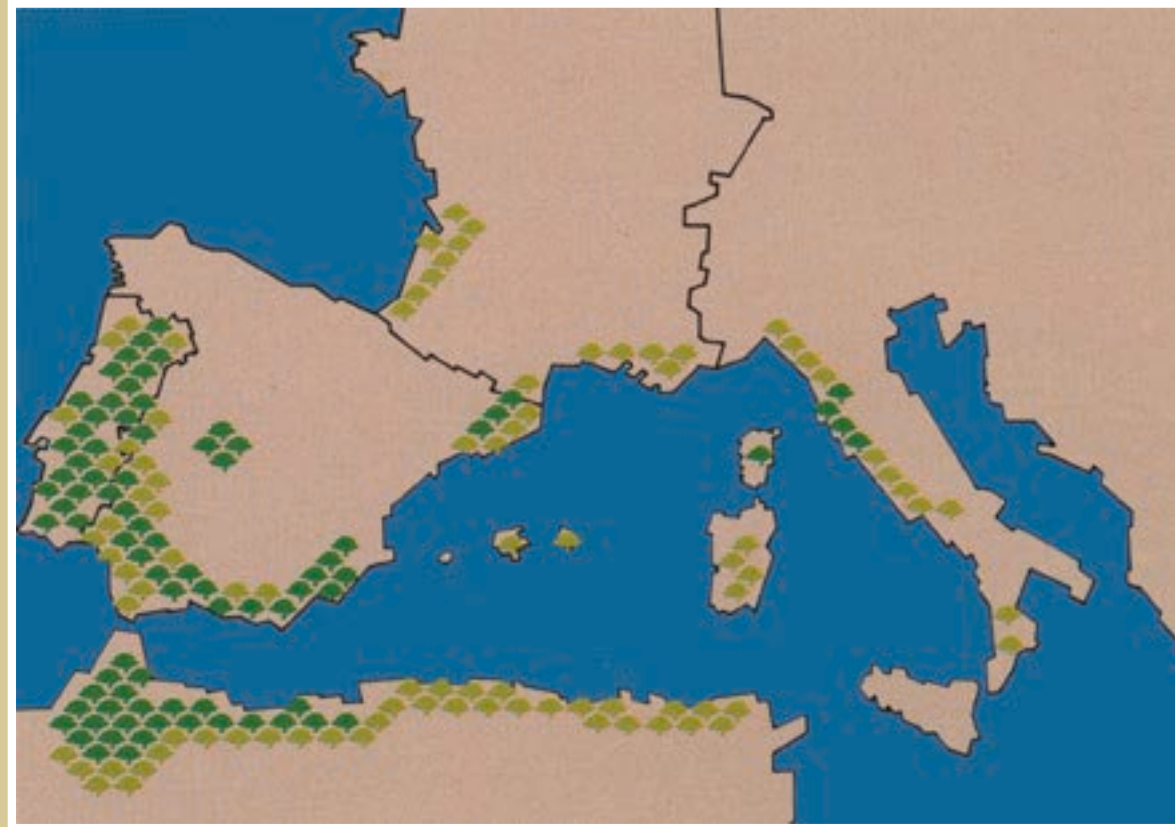
# Cork the bark of *Quercus suber*



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# Cork is native to the Western Mediterranean basin



# Portugal is main producer



| Country      | Area*            |            | Production*    |            |
|--------------|------------------|------------|----------------|------------|
|              | (hectares)       | (%)        | (tonnes)       | (%)        |
| Portugal     | 725,000          | 33         | 145,000        | 52         |
| Spain        | 510,000          | 23         | 80,000         | 29         |
| Algeria      | 460,000          | 21         | 20,000         | 7          |
| Italy        | 225,000          | 10         | 15,000         | 5          |
| Morocco      | 198,000          | 9          | 9,000          | 3          |
| Tunisia      | 60,000           | 3          | 6000           | 2          |
| France       | 22,000           | 1          | 5000           | 2          |
| <b>Total</b> | <b>2,200,000</b> | <b>100</b> | <b>280,000</b> | <b>100</b> |
| Australia    | 10               |            | -              | -          |

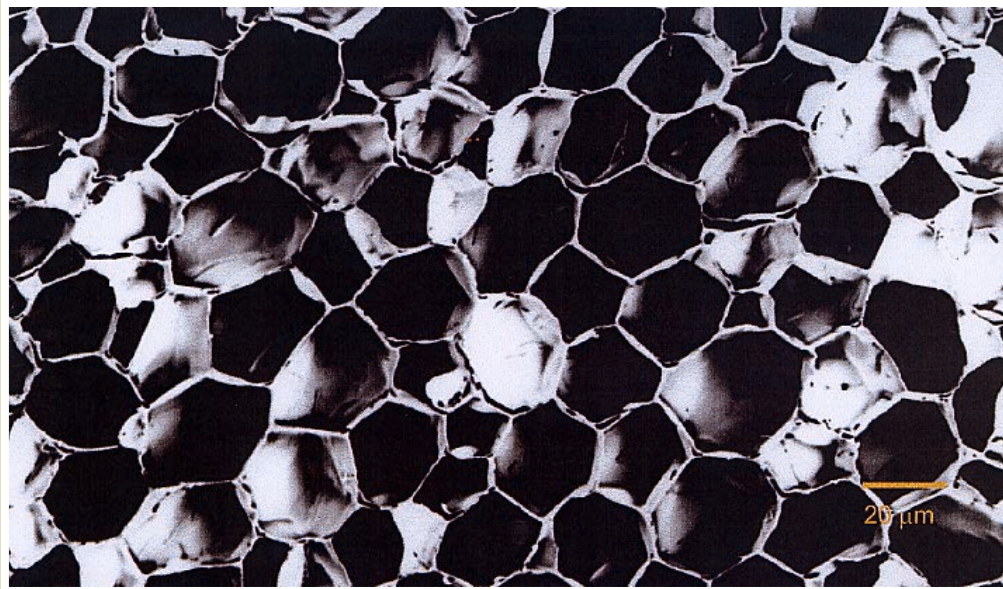
\* 1999

# Cork and wine industries have grown together



- **Used in ancient Egypt, Greece and Rome**
- **1600s—Dom Perignon first sealed wine with cork**
- **Industry growth in 1700s coincided with mass production of cylindrical glass bottles**

# Cork's physical properties give it unique sealing abilities



## Technical properties

- Elastic memory
- Gradual recovery
- Impermeability
- Inertness
- High insulation value
- Allows wine to develop gradually

# Proven technical performance in AWRI trial



- **Natural cork and Twin Top at or close to top on most parameters**
  - 3 of top 4 closures
- **Free SO<sub>2</sub> —Twin Top performed very well**
- **Consistent with Excell and Geisenheim results**

# Cork is a unique environmental product



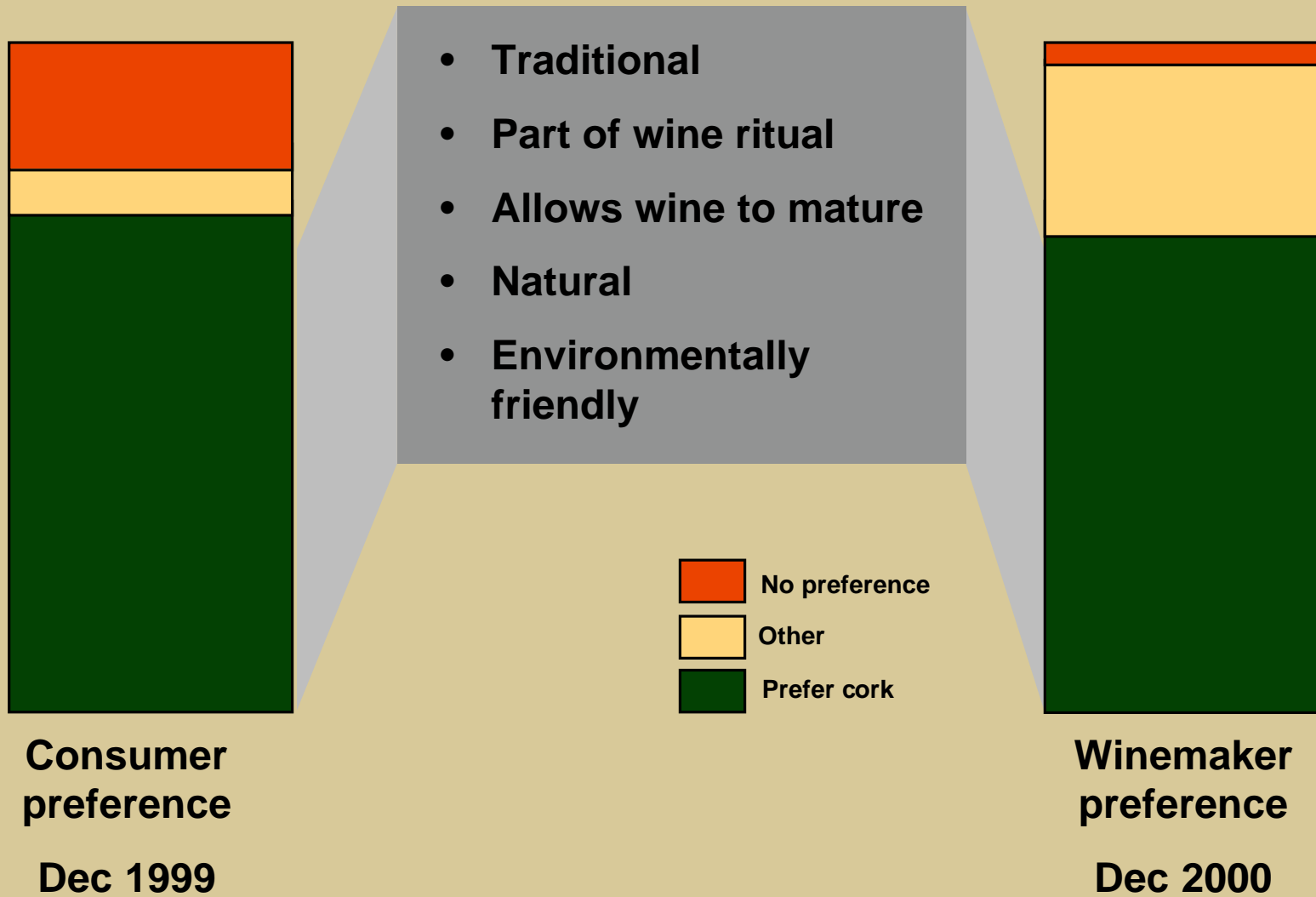
## Environmental properties

- **Natural**
- **Renewable and sustainable**
- **No waste**
- **Recyclable**
- **Biodegradable**
- **Protects fragile ecology, habitat for endangered species**

# Cork is preferred by most consumers and winemakers



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## 1. Why use cork?

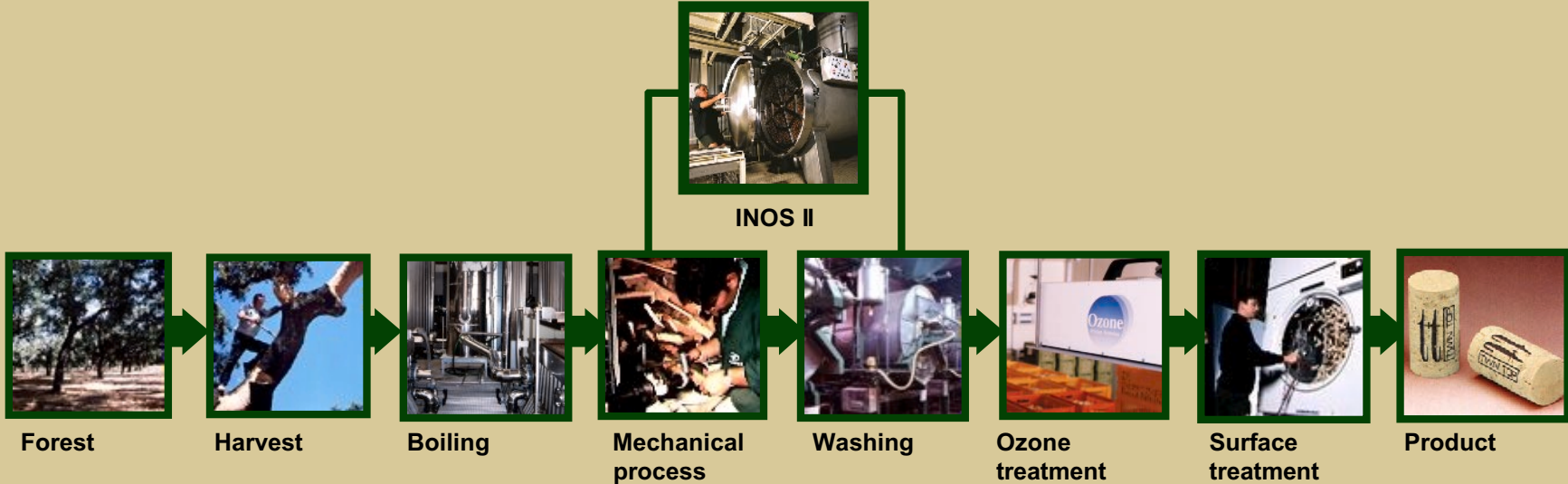
## 2. Producing high-performance corks

- ¥ Production process
- ¥ Quality control
- ¥ Research and development

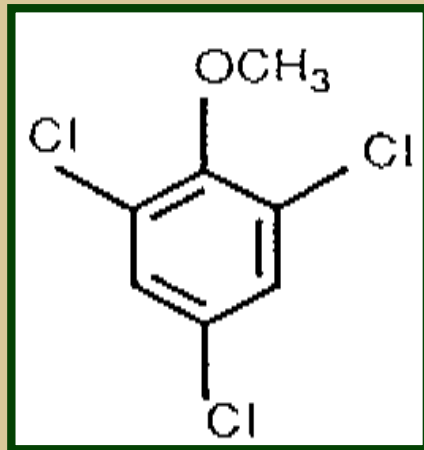
## 3. Choosing and using cork

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# Cork production process

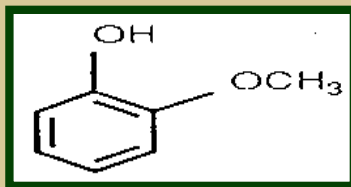


# Sources of off-flavours

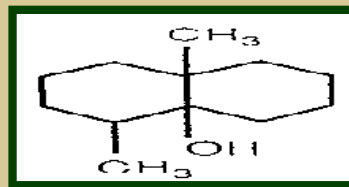


Musty, moldy, wet newspaper  
Flavor threshold: 4-6ng/l

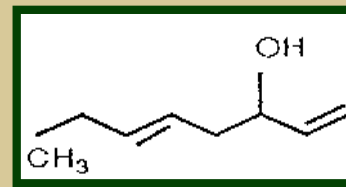
2,4,6 - Trichloroanisole



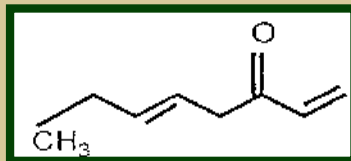
Guaiacol



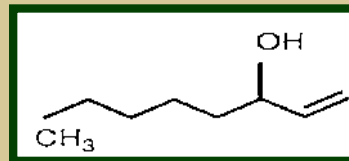
Geosmin



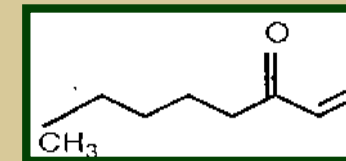
1, cis-5-octadien-3-ol



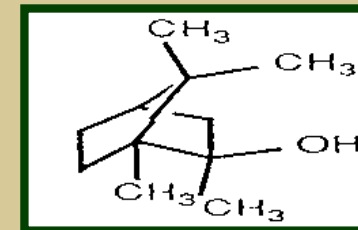
1, cis-5-octadien-3-one



1-octen-3-ol

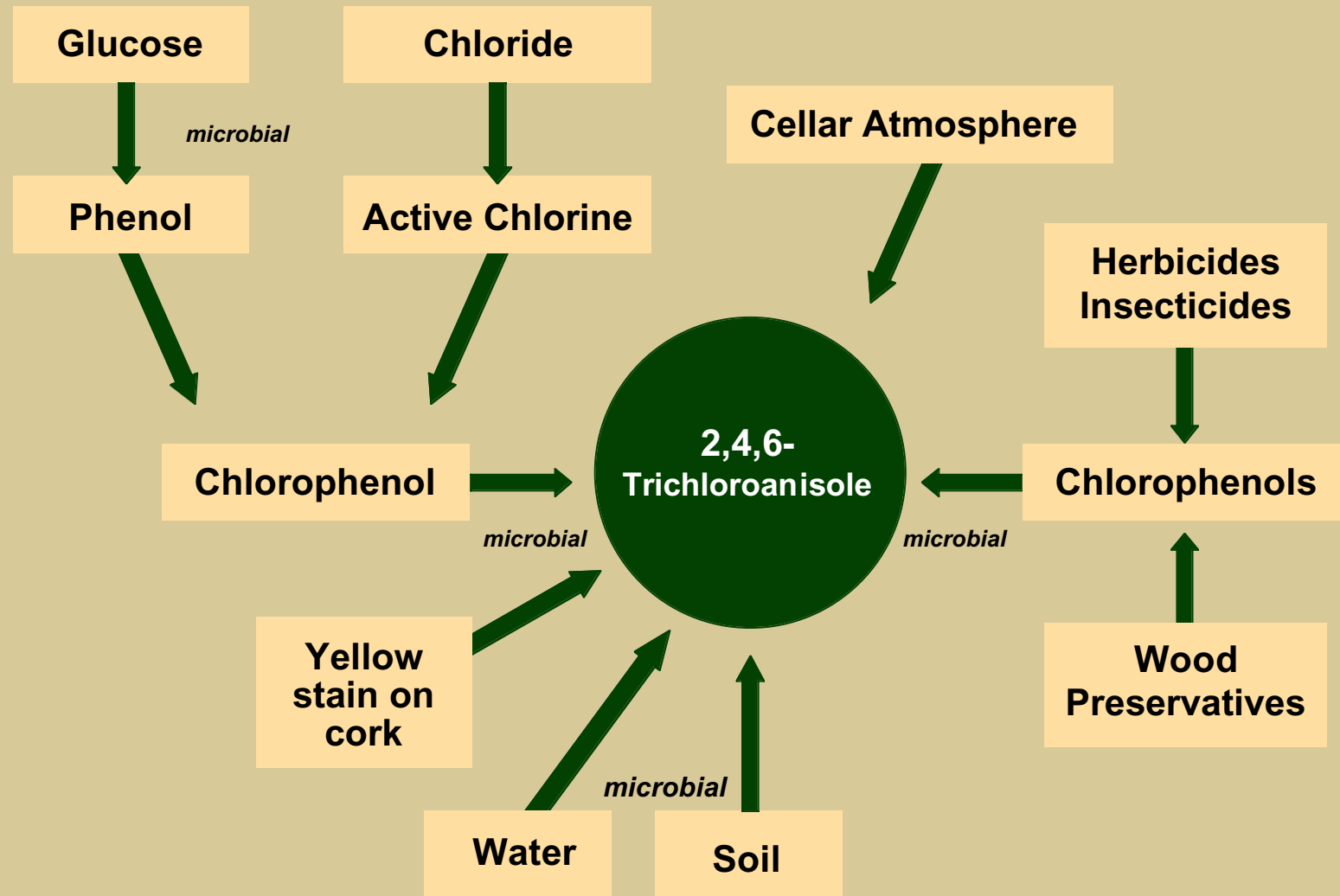


1-octen-3-one



2-methylisoborneol

# Pathways to TCA formation



(Quercus Project, 1996)

# Technical advances aim to reduce TCA contamination

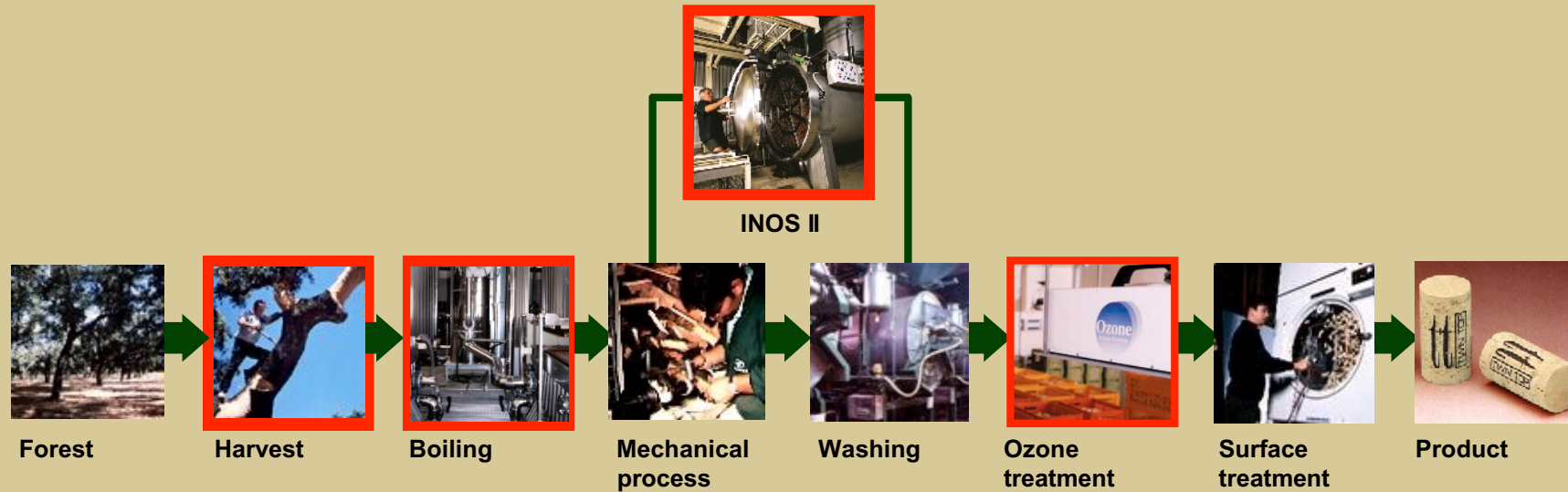


- **Better selection and storage of raw material**
- **Improved cleaning of raw material**
- **Environmental protection during and after processing**

# Recent technical advances aim to improve selection, cleaning and environmental protection



- New harvesting and storage practice
- New boiling system
- INOS II
- Ozone



# New harvesting and storage practice

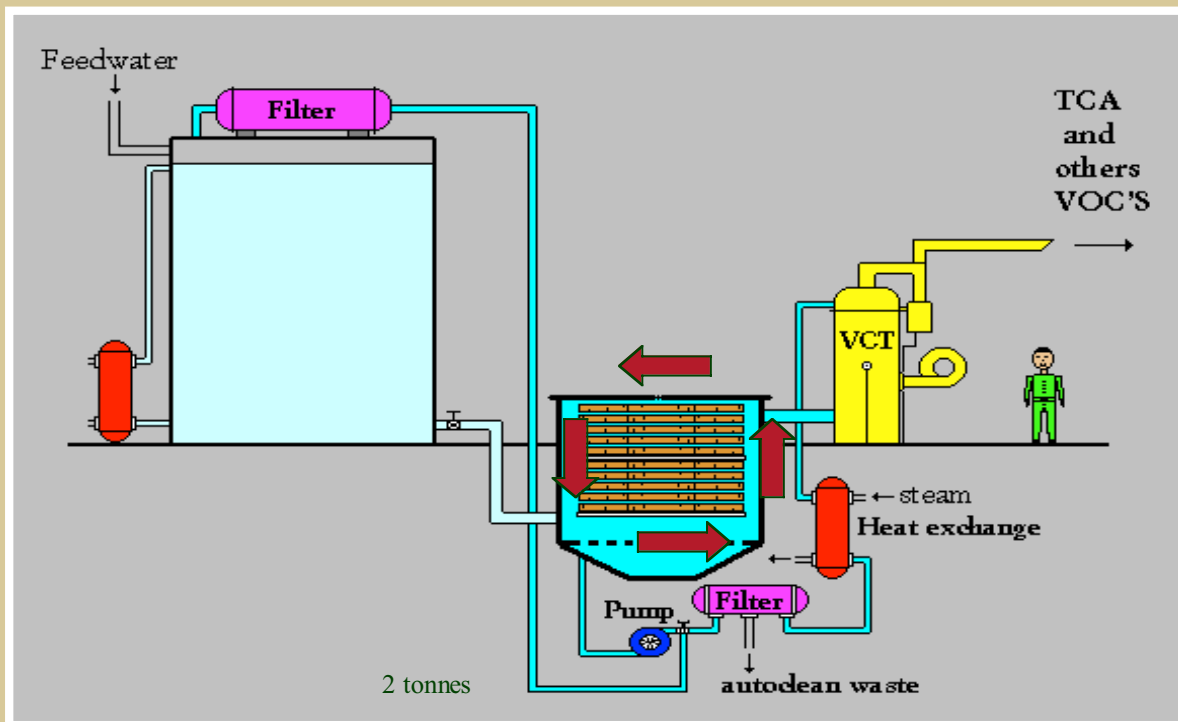
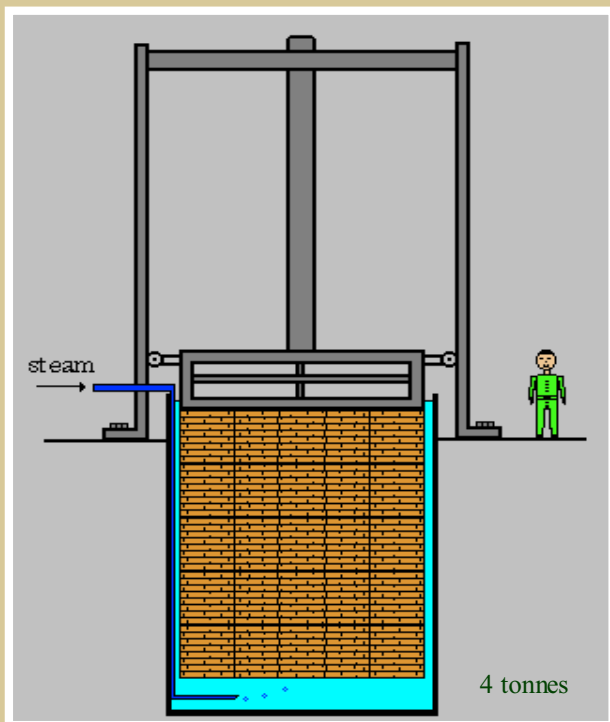


- **Lowest part of bark discarded**
- **Stored off ground**
- **Tracking of cork from individual properties to identify best quality and trace faults**

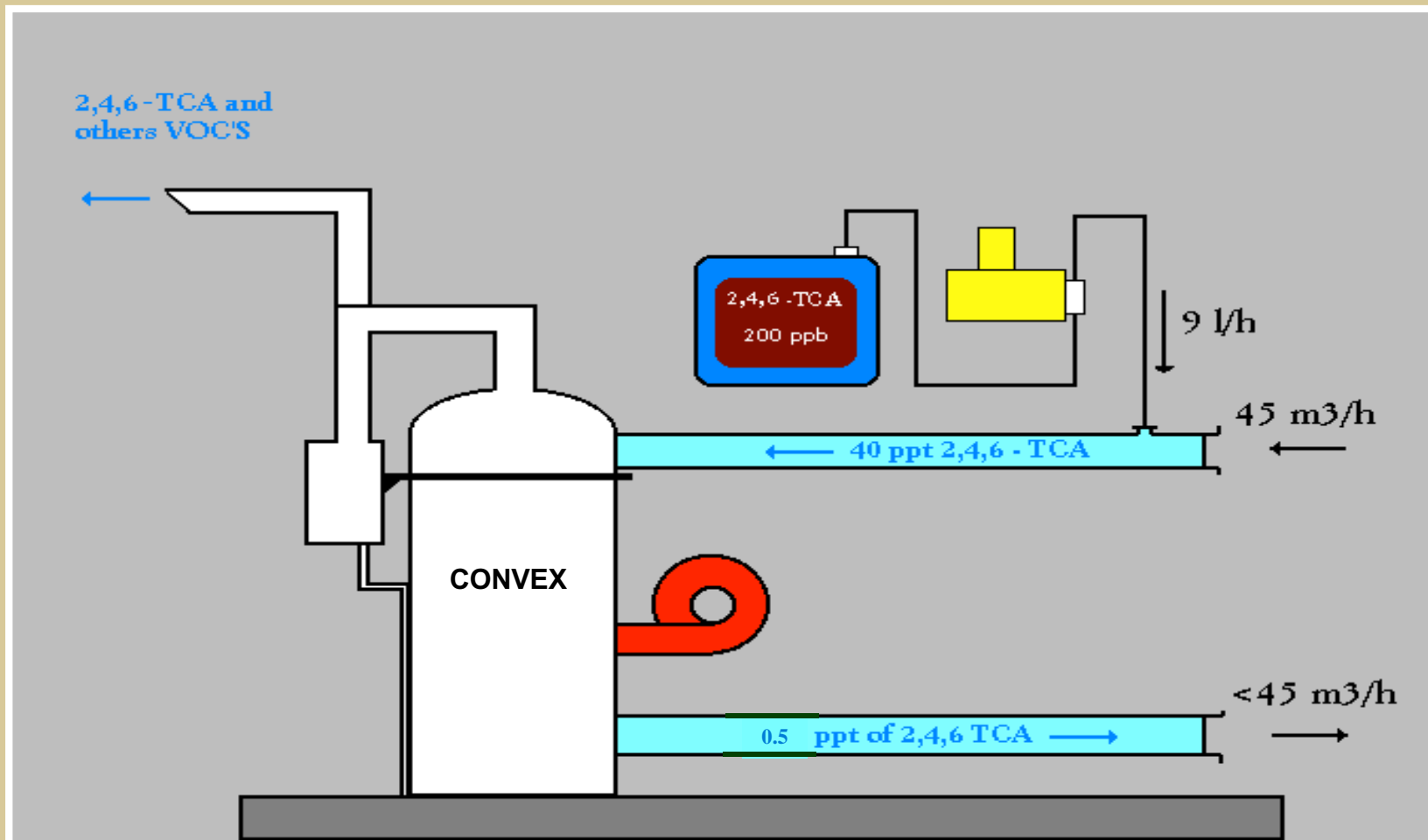
# New Amorim boiling system



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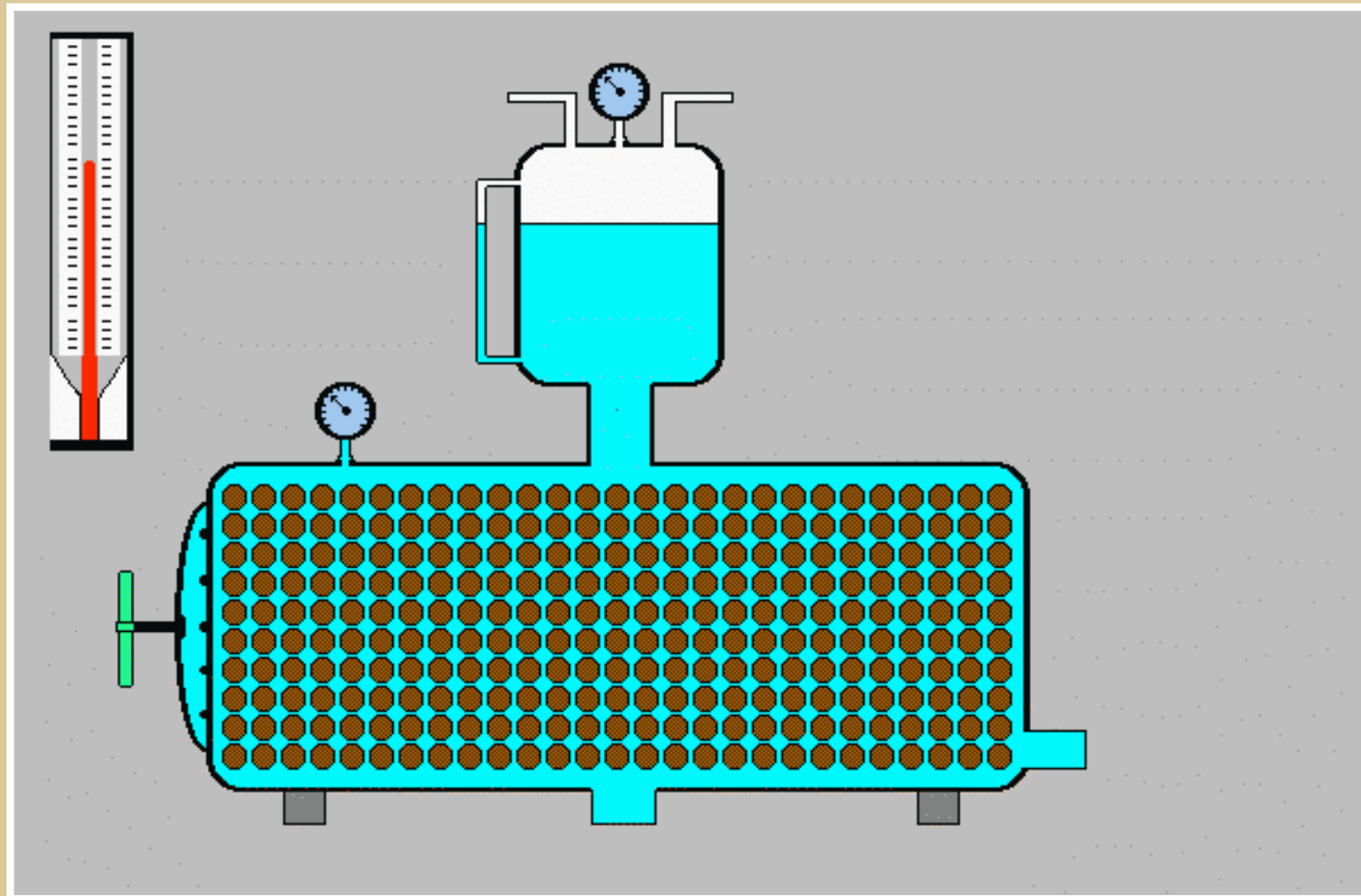
# New Amorim CONVEX process



# INOS II process for Amorim Twin Top<sup>®</sup> and SPARK<sup>®</sup> corks



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# Trialling of ozone as disinfectant and deodorising agent



- In washwaters

- In storage chambers

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# Exhaustive quality control tests in Portugal and Australia to meet winemaker specifications



- ¥ **Visual (porosity, defects)**
- ¥ **Dimensions**
- ¥ **Moisture and solids content**
- ¥ **Surface coating**
- ¥ **Residual oxidants**
- ¥ **Extraction and push force**
- ¥ **Pressure sealing**
- ¥ **Turbidity**
- ¥ **Heat stress**
- ¥ **Long-term sealing**
- ¥ **Sensory**
- ¥ **Microbiological**

# Extensive R&D aims to achieve continuous improvement



- **Validate processes**
- **Identify and address critical risk areas**
- **Introduce new products**
- **Undertake fundamental research**

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# Types, dimensions and grades of cork vary

**Natural corks**



**Technical corks**



**Twin Top®**



**SPARK®**

**Other**



**Colmated**



**Bartop**

# Selecting your corks



**Match cork  
and bottle  
neck  
diameters**

**Wine with  
high CO<sub>2</sub>  
may require  
larger  
diameter  
cork**

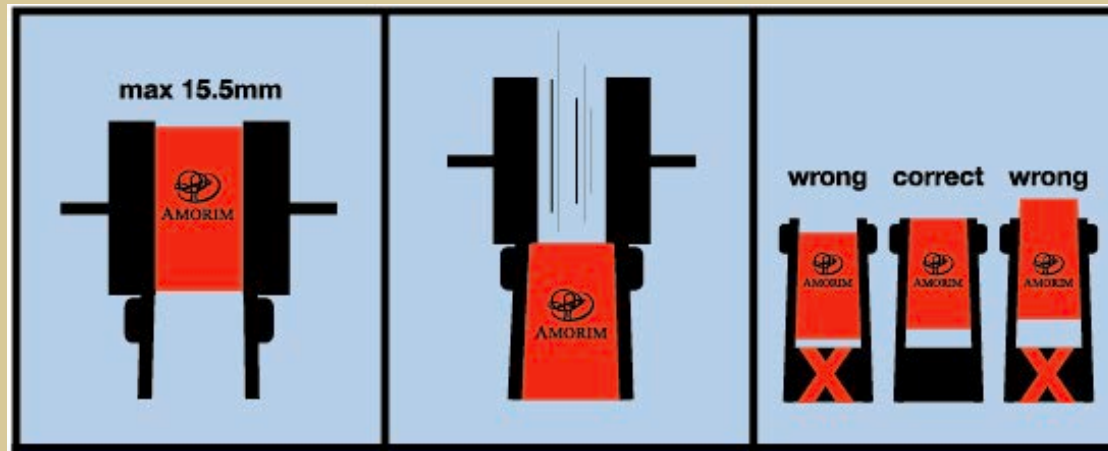
**Order for  
immediate  
or fast use**

**Store with  
good  
ventilation,  
controlled  
temperature  
and humidity**

# Inserting the cork



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Compress  
slowly to  
≤ 15.5 mm

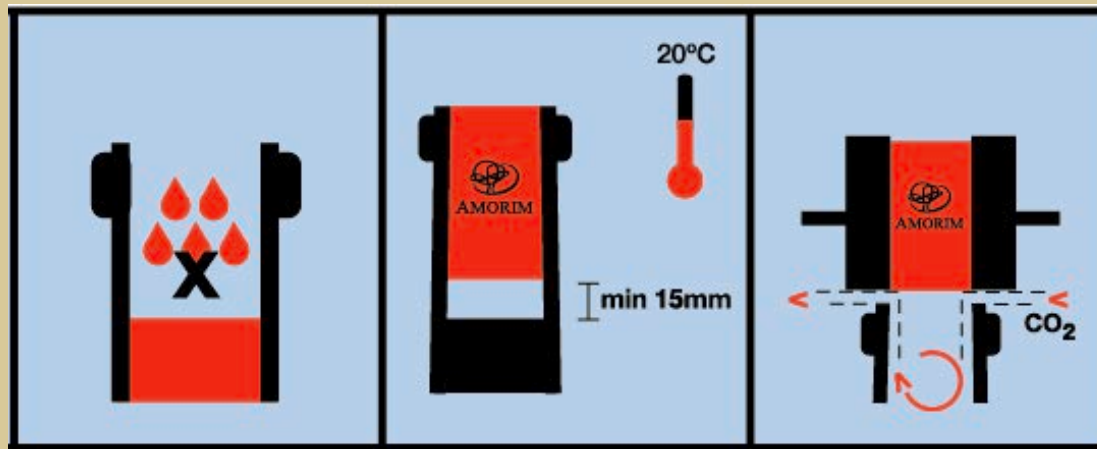
Insert as  
fast as  
possible

Insert to  
1mm below  
standard  
bottle necks

# Inserting the cork



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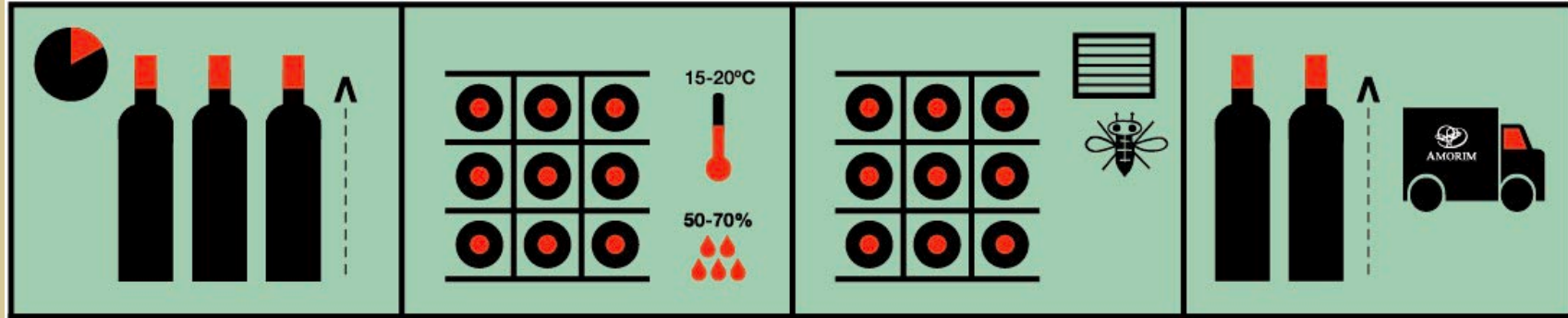


**Minimise  
moisture  
inside  
bottleneck**

**Allow 15 mm  
headspace at  
20°C**

**Vacuum  
bottling and  
CO<sub>2</sub> flushing  
reduce  
internal  
pressures**

# Post-bottling storage and transport of wine



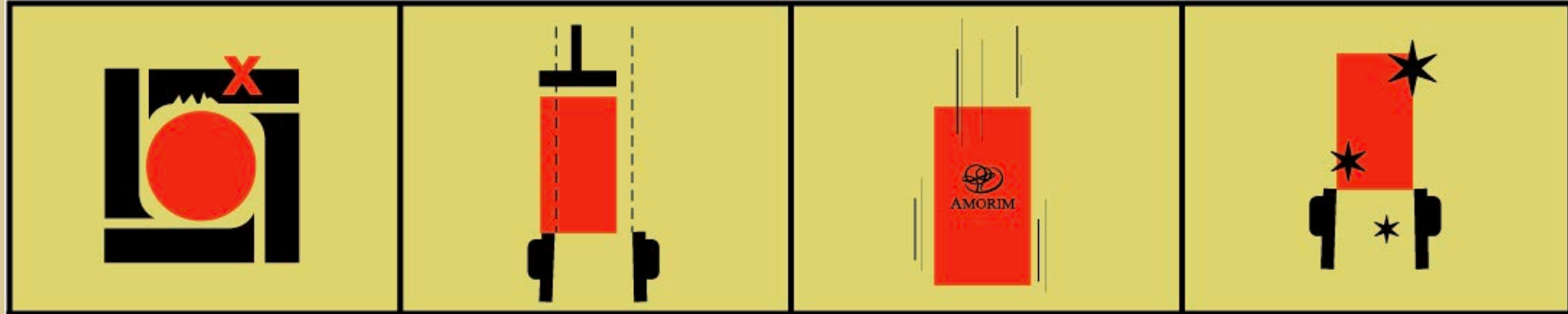
**Keep upright at least 5-10 minutes**

**Store at 15-20°C at 50-70% humidity**

**Keep cellar free of insects and chemicals**

**Transport in upright position**

# Maintaining corking equipment



**Maintain  
corker jaws  
– no nicks  
or wear**

**Align  
plunger and  
location  
ring**

**Ensure  
smooth  
operation**

**Clean with  
chlorine-  
free  
chemicals**

# For more information



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[www.corkfacts.com](http://www.corkfacts.com)

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[www.amorimcork.com](http://www.amorimcork.com)

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[www.amorimcork.com.au](http://www.amorimcork.com.au)

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