



# bark to bottle

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## AMORIM LAUNCHES ROSA

Following three years of research and development and a multi-million dollar investment, Amorim has committed to commercial production of its new cork treatment process known as ROSA.

The move follows independent validation of the process at an industrial scale by leading international wine research laboratories, which confirmed that ROSA reduces releasable 2,4,6-trichloroanisole (TCA) levels in cork by up to 80 per cent.

ROSA is being progressively introduced into Amorim plants and ROSA treated products are now on the market, starting with the granules that form the shanks in Twin Top® and Neutrocork® products

Three Amorim plants in Portugal are already using the ROSA process and another will be brought on-line throughout the first half of 2004.

ROSA is a cleaning process based on 'controlled steam distillation'.

Under this process, pressurised water and steam are used to force out volatile contaminants from the cork. The key to the effective application of ROSA is the careful control of variables such as water flow and steam temperature.

Before releasing ROSA to the market, the company commissioned the Australian Wine Research Institute (AWRI), Campden & Chorleywood Food Research Association (CCFRA) in the UK and the Geisenheim Research Institute in Germany to conduct validation tests on ROSA-treated granules.

Each laboratory undertook a series of chemical analyses on cork samples before and after treatment with ROSA to determine the reduction in releasable TCA.

The results were highly consistent, showing reductions of between 69 and 80 per cent in the average level of TCA in the cork, and provide strong evidence that ROSA is an effective industrial treatment for TCA-affected wine corks.

A 12-month Amorim trial under normal cellaring conditions has shown a very significant reduction in the average incidence of TCA in bottled wine sealed with ROSA treated corks. The closures in



→ Amorim can now offer winemakers ROSA-treated corks.

this trial included both technical and whole natural cork stoppers.

The chairman of Corticeira Amorim, António Amorim, said Amorim could now begin to offer winemakers the benefit of ROSA-treated corks.

"The board made a leap of faith in committing to develop ROSA three years ago and we are delighted that the results justify that investment. I congratulate our R&D team on a job well done," he said.

Amorim's head of research and development, Professor Miguel Cabral said Amorim was confident about completing development for whole corks and cork discs.

"There are still some engineering issues to resolve, but everything tells us we are heading in the right direction," he said.

Prof. Cabral cautioned that, while ROSA does not eradicate TCA, it formed a key element in a package of initiatives developed by Amorim to defeat the problem.

"Amorim's whole strategy is based on using a combination of preventive and curative measures to avoid or remove cork contaminants at each critical point in the production chain," he said.

In the last five years, Amorim has introduced a range of preventive measures to tackle cork contamination including new raw material selection procedures, innovative boiling systems, the INOS treatment of cork discs, the use of ozone, and sophisticated chemical analysis to enhance quality control.

"ROSA adds a powerful curative measure to this armoury," Prof. Cabral said.



## TALKS IN UK

Amorim's UK Retail Liaison Centre has established productive dialogue with all leading wine retailers in Britain after just eight months of operation.

Headed by Ann Harkins, a former quality control manager with a leading UK supermarket chain, the centre is an Amorim initiative.

It was developed to further enhance direct contact between wine retailers and closure suppliers in order to build greater understanding between the two.

One of its main objectives has been to lead retailers and closure suppliers away from unproductive public debates on matters relating to wine closures and into a proactive process of private and constructive dialogue.

The feedback after the latest round of discussions in September was particularly positive.

"The retailers have been impressed with Amorim's commitment to the UK market and the fact that it has a dedicated resource here," said Ms Harkins.

"They have also acknowledged what Amorim has achieved to date in its fight against TCA and the extent of the ongoing effort the company is making."

The benefits of the centre are expected to flow in both directions. For retailers, the dialogue provides the opportunity to better understand cork and its technical capabilities as a closure and to communicate their requirements directly to the cork supplier.

According to Ann Harkins, retailers value the technical training Amorim is offering their staff. They have also welcomed Amorim's willingness to help them develop closure standards for their own-label wines.

For the first time also, Amorim is receiving direct input on the needs of the UK wine trade as it moves to improve its own quality performance standards.



→ Ann Harkins.



→ Amorim's R&D team has spent three years developing the ROSA process — the team's nucleus is (l-r) Isabel Roseira, Dr Stephan Dahl, and Prof. Miguel Cabral.

## ROSA RISES FROM BASICS

What may well be recognised as the single most significant weapon in the fight against 2,4,6-trichloroanisole (TCA) in cork began by reference to the compound's basic chemistry.

The ROSA process was built on the simple premise that steam could be used to extract TCA from contaminated cork.

Over three years and tens of thousands of tests later, the ROSA process is now being used commercially to successfully treat cork granules used in Amorim's Twin Top® and Neutrocork® products. Its development for stoppers and discs is proceeding at a good pace.

The road in between has been long and laboured, with some major engineering obstacles overcome along the way.

According to Amorim's head of research and development, Professor Miguel Cabral, it has long been known that TCA is steam-volatile but the possibility of using this to combat TCA in cork had been overlooked.

"We were very excited by the possibilities, and even more so with the results of our initial laboratory tests. We were convinced we had the answer," he said.

However, while the research was relatively straightforward, the development — proving the process at an industrial scale — has been much more complex.

One early challenge was to achieve consistent reductions in TCA levels. Another was to avoid recontamination due to condensation within the ROSA chamber.

"We found several key variables, including water flow and temperature of the steam, influenced the effectiveness of the process," Prof. Cabral said.

"Once we got the balance right we were able to achieve consistently large

reductions in TCA contamination."

A further challenge, which affects ROSA's application to discs and stoppers, is the impact the process has on the physical properties and visual appearance of the cork. This has emerged at the semi-industrial scale.

The application of ROSA is more effective at very high temperatures, but an increase in temperature has a greater physical impact on the cork.

The problem has been solved, in part, by moving to a batch system rather than a continuous line process in applying ROSA to disks and whole stoppers.

At present, the Amorim team is working on steam flow adjustments to achieve the optimum result.

"Our goal is to extract any volatile compounds that are present including TCA, but we need to do this in a way that does not affect the integrity of the cork," Prof. Cabral said.

"We also need to do this cost-effectively. Of course, we can rectify physical deformation, but we would rather avoid having to so we can keep costs down.

"We are confident that further development of the ROSA process will overcome most of the remaining challenges.

"It is important to realise, however, that ROSA is only one part of Amorim's overall strategy to improve the quality of our products."

Prof. Cabral said one of the greatest moments for his team — which comprises Doctor Stephan Dahl and Isabel Roseira — in the three-year development of ROSA came when the Amorim board recognised the potential of the new process and committed millions of dollars to bringing ROSA-treated products to the market.



# BARK TO BOTTLE: PROCESSING

The early stages of cork processing play a critical role in the production of a high performance natural cork wine closure.

Today, the six-month 'seasoning' of the cork bark is undertaken at Amorim's plants rather than in the forest. The bark planks are stored on an incline, with improved circulation and drainage. Cork that comes in contact with the ground during seasoning is used for flooring and insulation materials.

From this point, all cork that is destined for wine stoppers is moved about the factory on stainless steel pallets.

After seasoning, the cork planks are boiled in water for 60 minutes to remove impurities and make the bark more pliable.

The new Amorim boiling process (introduced in 2000 at a high-tech plant at Pont de Sôr and in 2001 at Coruche) utilises better water circulation and more even temperature distribution to enhance the extraction of contaminants.

The system also filters out suspended solids and evaporates volatile compounds from washwaters using the CONVEX (continuous volatile extraction) process.

Because of the lower humidity content of the cork under the new boiling process, the cork planks need only be left to stabilise for three days (instead of three weeks), thereby reducing the risk of mould growth considerably.

Another recent Amorim innovation is a stabilisation chamber in which the cork planks are stored in a sterile, ozone-controlled atmosphere and gradually rehumidified.

During the stabilisation period, the planks become flatter and reach their optimum humidity for processing.

Each plank's border is then prepared

and its edges trimmed before an initial manual grading. The planks are sorted into quality categories based on their thickness, porosity and appearance.

Planks that contain faults are eliminated and granulated for use in other non-stopper cork products.

Only the best quality planks are chosen for whole stoppers and discs for champagne and Twin Top® corks. The side portions that are not used, become re-work material that is granulated to make the bodies of champagne and Twin Top® corks.

At this stage, the planks are sliced into strips slightly wider than the length of a cork.

These strips are punched along the grain of the bark. An automatic machine can punch 45,000 corks a day. The best quality bark is still punched by skilled workers, who can punch 20,000 corks in a day.

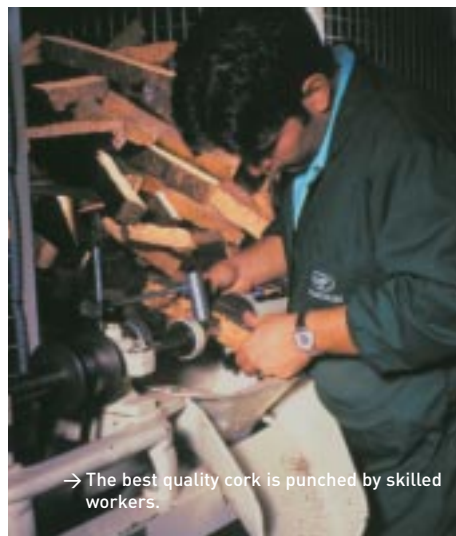
At this point the process varies depending on whether the factory is processing granules, discs, or whole cork.

For example, the discs used in Twin Top® and SPARK® champagne corks are put through Amorim's exclusive INOS II washing system. Cork granules, on the other hand, are subject to the revolutionary new ROSA steam cleaning process, which will in time be extended to all cork products.

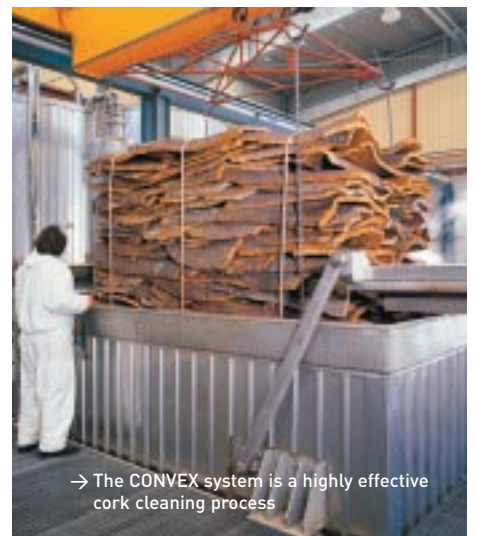
Following these processes, whole corks and assembled technical corks are polished to ensure the ends are regular and the stopper is the length required. Again, they are washed, this time in hydrogen peroxide, which disinfects the stoppers and homogenises the surface, ensuring they are suitable for contact with wine.

This stage is completed with the corks being dried in ovens with sterilised air up to a level of six to eight per cent humidity. They are then ready for sorting and finishing.

As part of its strict quality control regime, Amorim selects samples at each stage for exhaustive laboratory testing.



→ The best quality cork is punched by skilled workers.



→ The CONVEX system is a highly effective cork cleaning process

## A COMMITMENT TO RESEARCH AND DEVELOPMENT

Amorim has had an active cork research and development program for decades. In recent years, the investment in and intensity of this program has grown as Amorim strives to provide the wine industry with the most technically advanced natural wine closures. The chart below outlines recent Amorim initiatives in the area of research and development.

Amorim's Labcork laboratory established.

INOS II washing process developed for Twin Top® and SPARK® corks.

Ponte de Sôr factory incorporating new boiling system with (CONVEX) process.

New purpose-built research and development laboratory opened.

Establishment of Amorim Florestal for purchasing of all raw material.



1983

1992

1998

1999

2000

2001

2003

Amorim Academy established to encourage research that contributes to the advancement of wine.

R&D capabilities enhanced to validate plant processes and solve TCA problem.

Introduction of ozone-controlled stabilisation of treated corks.

New factory at Coruche for the production of champagne and sparkling wine discs.

ROSA process validated.



#### DROP US A LINE

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## IN BRIEF

### CHEMICAL ANALYSIS CUTS REJECTION RATES

Greater reliance on chemical analysis for quality control has dramatically reduced rejection rates of Amorim cork.

Originally purchased to support internal validation of the ROSA process, gas chromatographic machines are now a mainstay of Amorim's quality control regime.

Chemical analysis equipment is employed in all Amorim manufacturing plants in Portugal, testing product at all stages of production. Since 2001, Amorim has acquired five gas chromatographic units.

According to Professor Miguel Cabral, head of Amorim's Research and Development Department, the units have greatly extended the scope and efficiency of Amorim's quality control procedures.

Each machine can test dozens of samples every 24 hours with a high degree of accuracy.

"That's a much greater degree of control than we have with sensory analysis," Prof. Cabral said.

As proof of the benefits, Prof. Cabral said that in one year, chemical analysis of corks had virtually eliminated rejection of corks exported to the US market.

None had been rejected following internal sensory analysis by Amorim Cork America and none had been rejected by ETS Laboratories, which undertakes regular quality control checks of incoming corks for Amorim Cork America.

And in that time Amorim had not received a single claim from an American client. → 01

### FIRES HAVE MINIMAL IMPACT

Fires in Portugal last August caused only slight damage to the country's cork forests and it is expected that there will be little or no effect on Amorim's cork manufacturing operations.

The fires damaged 20 to 30 thousand hectares of cork forest, equal to about 3.5 per cent of the total Portuguese cork production area.

However, an initial assessment by Amorim's forest inspectors indicates that most of the affected cork oaks will fully recuperate, provided the damaged outer layer of cork is removed during the next two years.

The chairman of Corticeira Amorim, António Amorim, said the raw material for 2004 was already in storage at Amorim's major cork-processing facilities in the south of Portugal and this year's harvest was almost complete before the fires took hold. → 02

### UPDATE FOR WHISKY MARKET

Amorim held a technical conference in Scotland in early September to update the Scottish whisky industry, bottlers and retailers on recent developments in Amorim cork.

The half-day conference focused on natural cork closures for spirits, working under the title: *Technical and quality innovations in Amorim cork stoppers for the spirits industry.*

Leading technical, quality and purchasing managers from some of the country's key whisky brands, bottlers and retailers attended the seminar.

The conference featured keynote speeches on Amorim innovations in bar top cork production with the main address by Amorim's head of research and development, Professor Miguel Cabral.

Deborah Guimaraens, the product manager at Amorim & Irmãos who is responsible for natural bar top closures worldwide, said: "We were very pleased to bring our experienced team to Scotland to acquaint the Scotch whisky industry with the latest developments in natural bar top cork closures."

In 2002 Amorim secured a contract with

the world's largest whisky producer, United Distillers and Vintners (UDV) to provide bar top corks for the company's premium malt whisky range. → 03

### NEW MD FOR AUSTRALIA

Tony Telfer has been appointed managing director of Amorim Cork Australia.

With over 25 years experience in the wine and packaging industries, Mr Telfer has been with Amorim Cork Australia as general manager since September 2002.

His background includes over a decade with leading Australian wineries working in technical departments as a wine chemist and quality manager.

Prior to joining Amorim, Mr Telfer worked with Scholle Corporation in both the United States and Australia in the packaging and chemical processing industries.

He replaces Noel Heyes who is retiring in mid-2004 after 30 years with Amorim Cork Australia (formerly Cork & Seals). Mr Heyes will continue his relationship with the company as a non-executive director and chairman of the board.

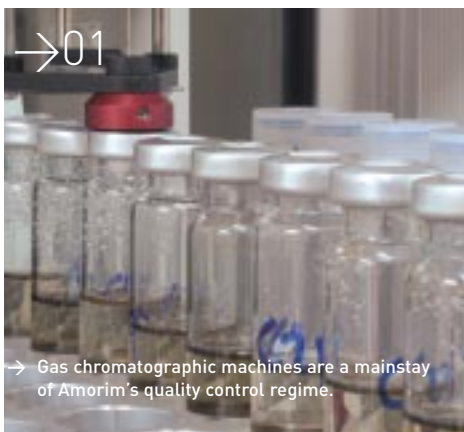
### WAITROSE OUTS PLASTIC: 600 WINES UNDER NATURAL CORK

British food and drink industry publication, *The Grocer*, has reported that large supermarket chain Waitrose is banning synthetic closures from its shelves.

A Waitrose wine buyer is quoted in the article as saying that customers have driven the move.

He suggested that plastic stoppers are not user-friendly and that customers felt they were difficult to remove or reinsert in a bottle.

According to *The Grocer*, 90 wines in the Waitrose range currently use synthetic closures compared with 63 wines under screwcap and 600 under natural cork.



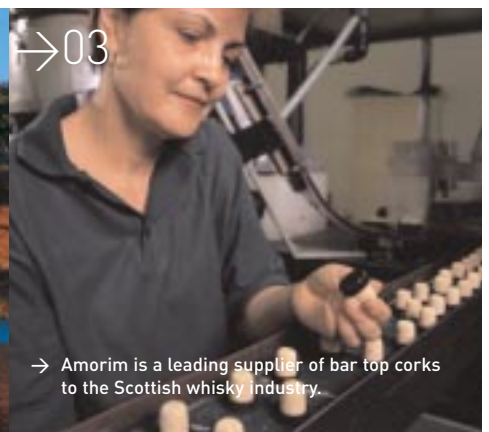
→01

→ Gas chromatographic machines are a mainstay of Amorim's quality control regime.



→02

→ This year's harvest was almost complete before the fires in Portugal's cork forests.



→03

→ Amorim is a leading supplier of bar top corks to the Scottish whisky industry.