



Our diversity, your singularity

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Aging and vinification vessels
in terracotta, stoneware,
technical ceramic and granite.

Several shapes, several volumes.

A human-scale company, we guide you in choosing the vessel best suited
to your specific needs, your terroir, your method.

Crafted from **exceptional natural materials** by artisans
with centuries of expertise and adapted to modern practices,
our amphorae are a strategic tool for true artisans of taste -
winemakers, brewers, distillers
and all creators of pure, natural beverages with
a distinctive identity.

Ageing in our amphorae means choosing quality
and responding to the evolution
of consumer taste.

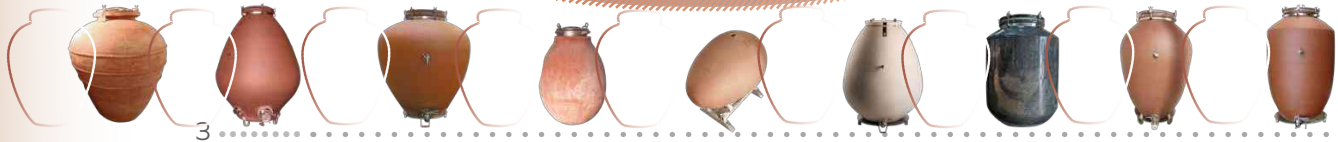


Photo credit : Domaine Le Songe de Don Bosco

V&T AMPHORES offers...

A range unique in its diversity, featuring
4 materials, 9 vessel types,
available in multiple volumes,
representing 20 different models
to better serve your needs.

Our amphorae are present today :



on 5 continents
in 30 countries
with more than 1,300
winemakers, brewers,
and distillers
in France
and over 300
worldwide

More than
200 special cuvées
are produced
in our vessels.

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Advantages of our jars

Diversified micro-oxygenation according to the chosen material

Preservation of fruit and terroir aromas

Ionic exchanges promoting minerality and texture

Production of light, fruity and digestible wines and other beverages

Reduction or elimination of oenological additives

Natural thermal insulation superior to stainless steel

Exceptional durability : a well-maintained jar lasts over 100 years

Controlled hygiene

Creation of truly distinctive, exceptional cuvées

Best value for money on the market

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Photo credit : Château Meylet

Our Natural Terracotta range



Jar

The classic and versatile model. Rounded sides and standard opening for fermentation and ageing.

Capacity	Height	Diameter	Weight
80 L	80 cm	55 cm	80 kg
300 L	110 cm	86 cm	140 kg
500 L	122 cm	100 cm	170 kg

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* See P.9 &
Study
on Movement P.30

« These amphorae bring out the grape variety by revealing its purity to obtain authentic wines without artifice. Terracotta produces pure wines with freshness, softness, a hint of minerality and a beautiful length on the palate, reminiscent of the wines of antiquity. »
@Le Clos d'Elpis,
double medallist at Grenache du Monde 2022



Egg

The ovoid shape generates a natural circular movement of the fine lees. Roundness, complexity and finesse.

Capacity	Height	Diameter	Weight
450 L	130 cm	95 cm	200 kg

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Key qualities of our terracotta jars

Terracotta d'Impruneta
Label

- Authenticity of aromas •
- Respect for the grape variety •
- Preservation of fruit quality •
- Velvety and rounded tannins for wines •
- Good thermal insulation •

Natural

This is a natural clay that requires no coating and allows the liquid to be in **direct contact** with the wall.
It is a material that promotes **micro-oxygenation** of beverages by softening them. Fruit expresses itself fully.

Handcrafted

V&T Amphores has selected its potters in Impruneta, Tuscany. This small village was already producing Orcio in the Middle Ages - those large jars intended for the preservation of olive oils and wines.
The method has not changed since then. Each jar is made entirely by hand. This slow and precise gesture allows the potter to reinforce areas that require it, but also to transmit to the piece something indefinable - an intention, an expertise inherited over several centuries.

Photos credit : Domaine Santa Duc,
Chamapagne La Compresse, Mas Du Novi,
Atelier Artenova

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Our Stoneware range

The shapes act on the movements of the liquid.
See *Study on movements* : page 30.
Movement speed, distribution & amplitude
from 1 to 5 :

All our jars are handcrafted, piece by piece.
Dimensions, colours and volumes may vary slightly -
this is the mark of their authenticity.
Wall thickness: approximately 2 cm.
Photos are non-contractual.

low 1 high 5



Zen

The pronounced angle at the top slows the movement. Straight, taut, elegant wines. Speed : 8 cm/day - the calmest of jars.

Capacity	Height	Diameter	Weight
80 L	83 cm	46 cm	80 kg
500 L	148 cm	90 cm	200 kg
1000 L	175 cm	110 cm	290 kg
1200 L	192 cm	113 cm	335 kg



Satine

Intermediate profile between Zen and Coralie. Smooth surface and moderate curve for softness and precision. Movement intensity : 2.

Capacity	Height	Diameter	Weight
200 L	100 cm	80 cm	90 kg
700 L	155 cm	98 cm	220 kg



Coralie®

Rounded shoulders that accelerate the movement (43 cm/day). Gentle movement with random directions. Fat, roundness, complexity. Movement intensity : 3

Capacity	Height	Diameter	Weight
320 L	115 cm	90 cm	130 kg
500 L	132 cm	106 cm	200 kg
1000 L	150 cm	127 cm	250 kg



Ovo

Classic ovoid shape. Up/down movement (60 cm/day) with random circulations. Perfect tension/roundness balance. Movement intensity : 3

Capacity	Height	Diameter	Weight
500 L	140 cm	95 cm	200 kg
1000 L	175 cm	130cm	350 kg



Ovo lying

Horizontal version of the Ovo for cellars with height constraints. Horizontal ovoid shape creating a constant speed propagation (130 cm/day). Intense natural movement. Movement intensity : 5

Capacity	Height	Diameter	Weight
300 L	85 cm	115 cm	110 kg

Bung hole Ø 5 cm

Our **N**atural Stoneware **range**

Sichuan stoneware **unique** in the world

To give producers a wider range of choices, we have also opted for stoneware, which provides less micro-oxygenation.

This stoneware is exceptional on two counts : its deposit is found only in the Red Valley of Sichuan, China. This single-terroir clay, rich in silica, possesses an exceptional quality that makes it particularly beneficial for the ageing of spirits and fermented beverages. China is one of the oldest cradles of stoneware and porcelain, where the first high-temperature stonewares have been used for over 2,000 years, notably in the form of jars for the production and preservation of rice wines and other spirits.

Committed to preserving this ancestral know-how, we draw directly from the sources of this intangible heritage.

Handcrafted production

Some traditional forms have been adapted to the needs of contemporary producers, others have been entirely designed by us. All are produced by Yunqiao, an expert Chinese ceramicist and long-standing loyal partner.

The production workshops are located in close proximity to the quarries. The clay is kneaded with spring water, then filtered to obtain a very fine-grained clay. The vessels are then assembled by stacking several layers of raw clay formed using moulds — guarantors of a certain regularity of forms — but each layer is assembled entirely by hand, allowing the potters to reinforce areas that require it.



Photos :
Atelier Yunqiao, Brasserie des Voirons,
Domaine du Chapital, Agricola Il Dosso

Key qualities of our stoneware jars

- Respect for the grape variety •
- Authenticity of aromas •
- Preservation of fruit quality •
- Gentle micro-oxygenation •
- Good thermal insulation •
- Delicacy, lightness, minerality, freshness •

Natural and reliable

Like terracotta, this is a natural clay that requires no coating and allows the liquid to be in direct contact with the wall.

Wholesome

Thanks to the crystalline structure of stoneware, our jars have a significant ionisation energy.

Resistant and insulating

These vessels are characterised by very high hardness and excellent resistance to chemical and thermal attack.

Practical

The smooth walls of the jars facilitate cleaning.

*«...Ageing in natural stoneware amphora produces drinkability more quickly than in tank or barrel. The wine comes together earlier. The fruit is more precise, the palate remains straight, freshness is well present.... »
Domaine Terres 2 Frères*

Handcrafted Technical Ceramic



Pure

Capacity	250 L	600 L	950 L
Height	95 cm	140 cm	150 cm
Diameter	75 cm	100 cm	125 cm
Weight	100 kg	220 kg	350 kg

Refined ovoid shape,
regular surfaces.
A precise and
easy-to-maintain
vinification tool.
Wall thickness : 3 cm.

Delivered on a wooden pallet,
Equipped with :
tap (except for the 250 L vessel),
Ø 40 mm Mâcon-type valve.

*"...Our secret is the jars from Vin et Terre !
For 8 months, our Clairette Rosé is aged in this jar,
conferring incomparable finesse and subtlety.
By tasting our Pénates et Lares you will discover this
particular signature that makes our 'small' white
a unique gustatory experience. "
Maison Damiano*



Photos :
Simone in his workshop

Key qualities of our technical ceramic jarres

- Pure and crystalline beverages •
- Subtle and regular micro-oxygenation •
- Optimised liquid movement •
- Measured and stable porosity •

In addition to our range of natural ceramics, we offer jars in so-called technical ceramic, made from assembled clays, produced by an Italian artisan-ceramicist near Venice.

This range is distinguished by:

- **The regularity of forms**
- **The ease of maintenance**

The vessels allow direct contact of the liquid with the material, thus promoting subtle and controlled micro-oxygenation, slightly lower than that of a barrel.
The cooking temperature takes place at 1050 °C

This amphora is obtained by mixing clay and *chamotte* (cooked and crushed ceramic). The addition of chamotte confers greater structure and resistance to the amphora.

The color of our amphorae is white because it is free of iron oxide.

Its refined ovoid shape promotes an up/down movement and random circulations of the fine lees, providing roundness.

Our Granite range



Tellurie

Capacity	360 L
Height	130 cm
Diameter	80 cm
Weight	300 kg

Wall thickness: 3 cm

Supplied with :
granite lid,
silicone gasket and bung,
stainless steel locking system,
stainless steel pallet.

Carved from a single block
of granite from the province of Hubei.



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Key qualities of our granite jarres

- Purity, tension ·
- Distinctive ionic energy ·
- Clarity, brilliance, freshness ·
- Finesse and silky character ·

Crystalline texture

A plutonic rock formed by the slow crystallisation of magma deep within the Earth, granite is rich in quartz, feldspar and mica. The higher its quartz content, the harder it is.

Indestructible

With a Mohs hardness of 6/10 and very low water absorption, granite does not succumb to the wear of time. It is one of the most durable materials in existence.

Timeless and unique

Over 300 million years old, granite possesses a crystalline structure with strong ionic activity - favourable to the genesis of secondary and tertiary aromas.

Great thermal inertia

Its great thermal inertia makes it an exceptional natural regulator : it is indeed for this property that it is used as ice cubes for whisky, without diluting the flavour.

We were inspired by its unique characteristics to offer you Tellurie, an amphora where the telluric force of this noble material fuses with the subtlety of your beverages, to create an unforgettable gustatory experience.

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Optional Accessories



Aseptic hand-blown glass bung
24 cm
34 cm
45 cm



Glass bung adapter
Bellot bung adapter



Stainless steel lid
Optional for stoneware and terracotta jars of 500 L and above



Double stainless steel valve with racking elbow
Optional for stoneware jars of 700 L and above



Stainless steel pallet
Optional for terracotta jars



Rotating stand
For Ovo horizontal 300 L in stoneware

Customisation



On request, we personalise your jars with your logo.

Stoneware bottles



Capacity	0.50 L	0.75 L
Height (± 2 mm)	20 cm	26.3 cm
Diameter (± 2 mm)	83.5 mm	83.5 mm
Neck	18.3 mm	18.3 mm
Weight	600 g	900 g
Number of bottles per pallet	1232	1056

Classic bottling



Photos :
Château du Pouey by Cyprien Courdon

User guide

THREE GOLDEN RULES :

1

No physical shock

Always handle with 2–3 people, with slow and gentle movements.

2

No thermal shock

Avoid sudden temperature rises — sudden hot water, hot pressure washer, steam generator.

3

No caustic soda (NaOH)

On terracotta and porous ceramic : caustic soda penetrates the pores and cannot be completely eliminated.

1 - RECEIPT AND INSPECTION UPON DELIVERY

! Fragile Materials !

Upon delivery, **as soon as the pallet is lowered to the foot of the lorry**, film the jar and its packaging all around **BEFORE the carrier leaves** (national requirement of carriers and insurers!).

- Check visually (torch), acoustically (e.g. tapping with a coin), olfactively (any possible contamination). Note your reservations on the delivery note before signing.

- **You have 48 hours to report** additional reservations after the water-filling test.

Follow the commissioning and operating procedure to the letter and within the required timescales.

➔ **In the event of any doubt** after this first inspection, note your remarks as reservations on the delivery note before signing it, before the delivery driver leaves. Take photographs ; in case of major and manifest damage, **you may refuse the delivery.**

NB : From the moment you sign the delivery note, the goods become **your property** as stated, as you will have noted in reservations on the document. Without this, by default, the goods are considered to have arrived and been declared compliant by you.

Photos : Domaine Guillemot Michel



- HANDLING PRECAUTIONS

Our jars are delivered on pallets to allow you to move them with a pallet truck :

- **Terracotta jars** are delivered on wooden pallets
- **Stoneware jars** are delivered with a circular stainless steel pallet

When moving your jar, always work with 2 to 3 people, using smooth and slow movements.

Set it down particularly gently, as pallet trucks allow by pressing their lever lightly at the end of the lowering.



! Never move your jar when it is full !

Caution : do not place your jar on a plastic pallet - plastic resistance is insufficient!

2 - COMMISSIONING — MANDATORY LEAK TEST !.....

Allow 1 week between receipt and first use. Fill the jar with water to overflowing.

- **Terracotta** : 48–72 hours minimum.
- **Stoneware, ceramic, granite** : half a day.

If the level stabilises at 3 days, the jar is watertight.
Beyond 7 days, call us : +33 (0)5 57 71 06 72.

The procedure serves to verify that no invisible damage occurred during transport, and also to ensure that all accessories are correctly positioned and secured. Check the correct compression of the internal and external seals of the airlocks, lids, drain valves and tasting taps. We advise you to clean the silicone seal of the lid before any use, with a non-chlorinated product.

Terracotta — mandatory pre-saturation with water

Its high porosity requires saturating the jar with water before any wine is introduced. Proceed as follows :

1. **Fill to overflowing along the outer walls** to moisten the entire jar.
2. **Close the lid, then finish filling via the glass airlock.** Ensure the jar is perfectly level during filling. On a sloping floor, the pressure of the liquid concentrates at one point and eventually causes localised seeping.
3. **Check the seal of all accessories** - valve, tap, airlock, closing system - as well as all the walls.

3 - TARTARIC ACID CONDITIONING

Terracotta only

Terracotta may reduce the acidity of wines (by 0.10 to 0.15).

1. Spray a solution of tartaric acid (H_2T), dilution 150 g/L of water . 3 passes recommended on the interior walls of your jar, spaced by a 24-hour drying period.

2. Rinse the interior of the jar until the water after rinsing has the same pH as the water used before rinsing (close to 7).

4 - INSTALLATION IN THE CELLAR

Your jar is ready. As terracotta is particularly sensitive to its environment, choose its location with care :

- **Cool place**, away from draughts and passageways
- **Healthy and sufficiently humid atmosphere** - 70 to 80% relative humidity is recommended to limit evaporative loss (consume).
- **Perfectly level floor** (see previous step)

In an air-conditioned cellar : terracotta dries quickly and may draw wine from the inside to rehydrate itself. Water it very regularly with pure water.

Note on mould : its appearance on the outer surface is normal in a humid cellar. Treat it as soon as it appears by scrubbing with a hydrogen peroxide solution, then rinse, or use ethyl alcohol.

5 - TERRACOTTA : OENOLOGICAL MONITORING

The high porosity of terracotta requires close monitoring at the start of ageing : **check the evaporative loss (consume) regularly** and taste frequently so as not to be caught out by the micro-oxygenation rate.

The aseptic airlock is your best indicator — it allows you to monitor the level and detect the onset of fermentation.

→ **Use of the glass airlock — critical vigilance point**

Fill the bowl only to 4 cm of sulphur solution — just enough to immerse the circumference of the bell and ensure the seal. Below this level, the seal is not guaranteed. Above it, the risk is reversed: in cold weather, the wine contracts as it cools and may draw the SO_2 solution into the jar.

The volume of solution must in no case exceed the volume of the trunk of the bell. Adding a few pinches of citric or tartaric acid improves the effectiveness of the solution in its role of capturing oxygen. Make sure not to seal the vessel hermetically during a fermentation phase. Otherwise it risks exploding before the airlock can blow.



6 - CLEANING THE JAR

Clean the interior immediately after emptying, taking care to eliminate all deposits — must, lees, tartrate — including in the least accessible areas. If necessary, lay the jar on its side against a thick shock-absorbing support (mattress, dense foam) — the support must be higher than what the jar rests on.

a - Water rinsing

Start at ambient temperature, then increase progressively if necessary (pressure washer or hot water).

Two absolute rules :

1. No thermal shock — no steam generator

2. No hot pressure washer around integrated stainless steel parts
their different coefficient of expansion from that of the ceramic can cause cracks and fissures.

b - Elimination of organic matter

- **Use hydrogen peroxide (H_2O_2)**

diluted in water according to the manufacturer's instructions. It is a powerful oxidant that eliminates organic matter (organic acids, phenolic compounds, polysaccharides, polypeptides), disinfects and removes stains, including in hard-to-reach corners.

- **Sodium bicarbonate + citric acid :**

naturally biodegradable mixture, no environmental impact.

Dosage : 1 part sodium bicarbonate to 2 parts citric acid, in 10% solution.

Example : 33 g of bicarbonate + 66 g of citric acid in 0.9 L of water.

-> Mix the powders dry before adding water : the effervescent reaction initiates on contact with liquid. **! Very foaming mixture !**

-> Apply by spray, leave for 20 minutes, brush, then rinse abundantly with clean water.

c - Tartrate removal with SO_2

- Fill the jar with water.
- **Inject 10 g/hL of pure sulphur dioxide** in gaseous form into the bottom, lid closed via the bung hole.
- Leave for 4 to 5 days.
- **Rinse with a pressure washer, progressively increasing temperature**, always gently.



➔ **WARNING : Caustic soda (NaOH)**

Terracotta and porous technical ceramic : strictly prohibited !

Caustic soda penetrates deeply into the pores and cannot be completely eliminated, even after intensive rinsing. Residual traces risk contaminating the following ageing.

Stoneware : its use is also strongly inadvisable :

corrosive in the long term. If used despite this warning, rinse imperatively and abundantly with a citric acid solution to neutralise any residual trace.

Once the jar is rinsed and drained, check the pH before returning it to service. It is then ready to receive must or wine.

7 - ALTERNATIVE DESCALING & CLEANING

MOOG Lance solution :

ATTENTION : If the jar is fitted with a hatch, neck or stainless steel accessory integrated into the ceramic, heat can cause it to expand and generate cracks or leaks. Adjust the temperature accordingly.

Parameters for use with an HP cleaner type Kärcher HDS :

Parameters	Terracotta	Stoneware
Flow rate	800–900 L/h	1,000–1,200 L/h
Nozzles	Flat jet 5°, size 02 to 05	
1st cycle	15 min at max 45 °C	
+2nd if necessary	15 min at max 55 °C	
Final rinse	Cold water after 30 min of cooling	

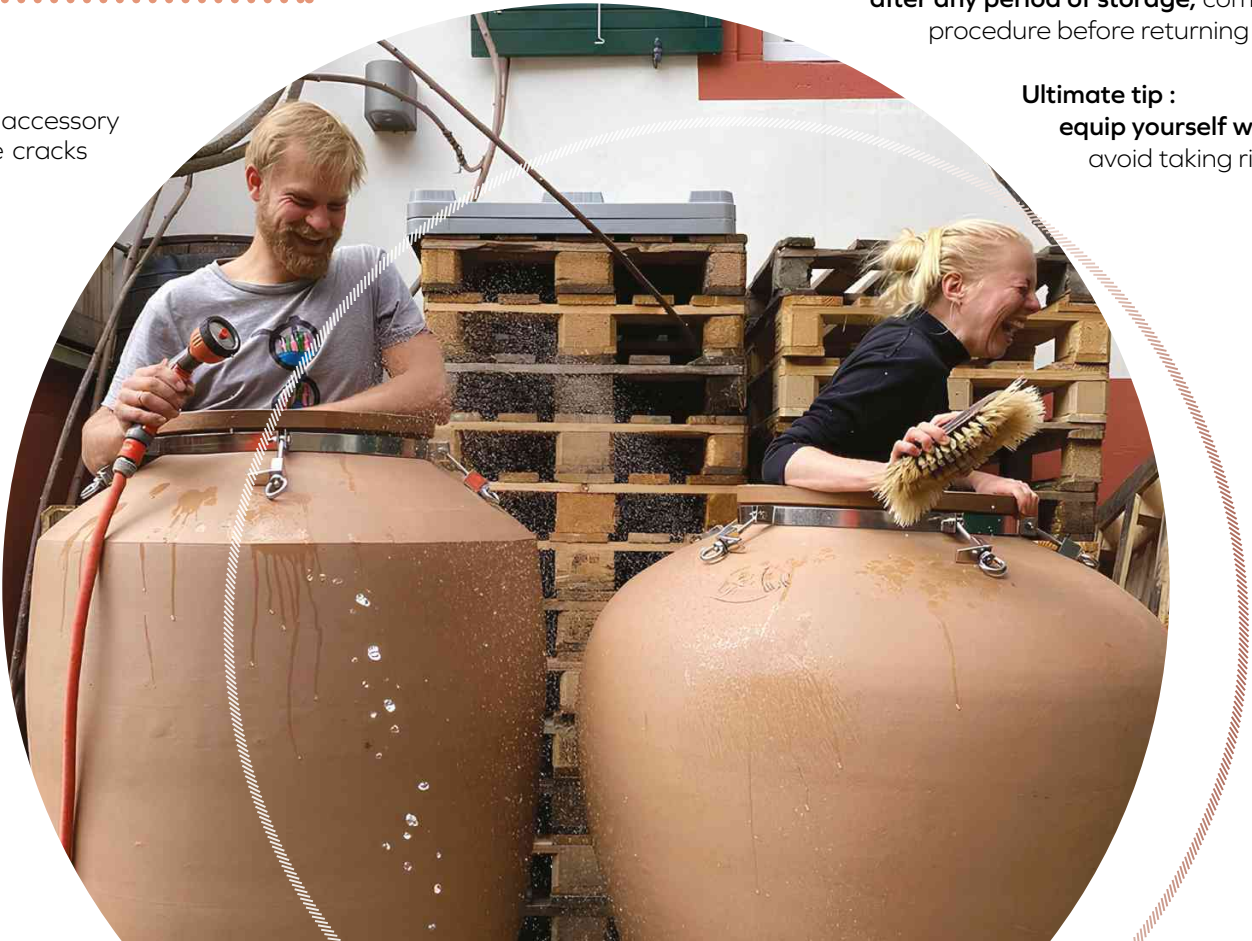
Use the MOOG BRA with the 400 or 600 L extension depending on the height of the vessel. Maximum pressure : 80 bars.
For more details, consult our website / News.

8 - STORING YOUR JAR

If you intend to leave your jar empty, certain precautions must be taken. After complete cleaning and rinsing, drain the jar and dry it carefully for at least 48 hours, then :

- **Place it in a dry location, never sealing it hermetically** — lid simply resting, airlock and valve open. A continuous fan can accelerate drying.
- **Ensure a healthy and neutral atmosphere:** no TCA, TCP, damp cardboard, treated pallets, or hydrocarbons nearby.
- **In case of doubt about hygiene, sulphur-wick as for an oak cask.** Jar must be dry before sulphuring — a damp jar produces sulphuric acid.
- **Terracotta specifically :**
after any period of storage, compulsorily resume the complete cleaning and conditioning procedure before returning to service.

Ultimate tip :
equip yourself with a liquid vacuum - this will facilitate your task at each step and avoid taking risks by laying the jars on their side. ➔



Regulations

EC 1935 / 2004
EC 2023 / 2006



All of our natural terracotta and stoneware jars comply with regulations governing materials intended to come into contact with foodstuffs.

These regulations can be consulted at : www.economie.gouv.fr/dgccrf/

Supporting documents relating to this compliance are available upon request. V&T Amphores encourages users to ensure that their product complies with the maximum acceptable limits for substances as defined in the annexes of the current International Code of Oenological Practices of the OIV.

Composition

| Art 2

The composition of the clay is essential, as it determines the firing temperature, the color, and the porosity of the jar. Our raw materials are composed as follows

Terracotta

Si : 41% - Al : 17,54% - Ca : 20,90% - Fe : 11,83% - K : 3,13% - Mg : 4,56% - L.O.I. : 1,04%

Stoneware

SiO₂ : 62,56% - Al₂O₃ : 18,29% - Fe₂O₃ : 7,09% TiO₂ : 0,02% - CaO : 0,28% - MgO : 0,80% K₂O : 2,22% - Na₂O : 0,11% - L.O.I. : 6,46%

(Si = silica, Al = alumina, Fe = iron, K = potassium, Ca = calcium, Mg = magnesium, Ti = titanium, Na = sodium, L.O.I. – Loss on Ignition)



Origin

| Art 2

Terracotta is a Tuscan galestro clay from Impruneta, Italy, protected by a certified designation (a terroir covering 200 km²).

Stoneware is a sedimentary silicate rock originating from the Sichuan Valley (Red Basin quarries) in China.

Its exceptional texture is unique in the world.

These are natural clay terroirs that have been recognized for their suitability for food contact for centuries :

- **nearly 1,000 years for terracotta** – ageing and storage of olive oil and wines.
- **nearly 2,000 years for stoneware** – ageing and storage of wines and rice spirits, fermentation of fruits and vegetables.

Alongside these terroirs, pottery workshops developed, where artisanal know-how emerged and has been passed down through generations.

Traceability

| Art 17

Each jar is numbered and corresponds to a clay batch number from a specific quarry layer.

Labelling

| Art 15

The food-contact compliance logo appears next to the serial number.

Inertness

| Art 16

Several COFRAC-accredited laboratories, such as Eurofins, SFC, and PH Labs SRL, are regularly consulted to analyze the inertness of our vessels (in particular to ensure the absence of heavy metal transfer). All laboratory analyses carried out can be provided upon simple request.

Physical poperties of our materials

At V&T Amphores, the choice of material is a founding decision. Each material has its own personality — porosity, thermal conductivity, mineral energy — that will leave its mark on your beverage. We offer four complementary families.

- Whatever material is chosen,
all our vessels are :
- Crystalline (≠ stainless steel, glass, polyethylene),
 - Inorganic (≠ wood)
 - Opaque (≠ galss)
 - Durable and resistant to corrosion (≠ wood)
 - Aromatically neutral (≠ wood)
 - Chemically inerte (see P.29).
 - Poor thermal conductors (≠ stainless steel)

TERRACOTTA- single origin clay

Terracotta Label Impruneta, Tuscany, Italy

The terracotta of Impruneta is unique in the world. This Tuscan village produces a clay enriched with galestro — a characteristic friable calcareous schist of the Tuscan Apennines.

Total Porosity *	31,8 % - the highest among our materials
Micro-oxygenation	Active and rapid during the first 15 days, then progressive
Firing	1,020 °C · Cycle of 48 to 60 hours
Insulation Conductivity	0,83 W/m·K
Composition	Si :41% -Al :17,54% - Ca :20,90% -Fe :11,83% K :3,13% -Mg : 4,56% -L.O.I. : 1,04%

STONEWARE - single origin clay

Sichuan Vallay, China

In the Sichuan Valley, the quarries of the Red Basin provide siliceous clay with exceptional mineral richness. Fired between 1,100 and 1,300 °C, it partially melts, filling its pores. It has a crystalline structure with high ionization energy.

Total Porosity *	5,6 %
Micro-oxygenation	Subtle and constant, similar to a new barrel: 1.7–2.3 mg/L/month
Firing	1,100 to 1,300 °C
Insulation Conductivity	1,30 - 1,8 W/m·K
Composition	SiO2 : 62,56% - Al2O3 : 18,29% - Fe2O3 : 7,09% - TiO2 : 0,02% - CaO : 0,28% - MgO : 0,80% - K2O : 2,22% - Na2O : 0,11% - L.O.I. : 6,46%

TECHNICAL CERAMIC

Artisan Workshop, Italy, Venice Region

Technical ceramic is composed of assembled clays enriched with chamotte (crushed and sieved fired clay) to reinforce the structure. It is distinguished by its ideal regularity for integrating accessories and by its increased ease of maintenance. Its ovoid shape promotes a circular movement of fine lees.

Total Porosity *	6,7 %
Micro-oxygenation	Subtle and controlled, slightly lower than that of a barrel
Firing	1,050 °C
Insulation Conductivity	3,1 W/m·K
Composition	Assembly of natural clays. Grog / Chamotte : clay fired at 1,050°C, ground and sieved)

GRANITE

Hubei Province, China

Granite is a plutonic rock formed in the depths of the Earth over 300 million years ago.. Rich in quartz, feldspar, and mica, it offers remarkable thermal inertia and a crystalline structure with high ionic activity. Our Tellurie jars are carved from a single block.

Total Porosity *	0,06 %
M icro-oxygenation	Near impermeable
Water Absorption	0.33% — total stability
Mohs Hardness	6/10 — extreme resistance
Compression Resistance	1400 kgs / cm2
Isolation Conductivity	1, 7 - 2,8 W/m·K
Composition	quartz, feldspar and mica

* Total porosity ≠ achievable porosity.
See the Study on the Porosity of Our Materials, P.32

Influence of our materials on wine

General Trends

NB : These trends are indicative — the grape variety is only one parameter among many. Terroir, climate, the winemaker's choices and viticultural practices play an equally decisive role in the final result.



Wine after 6-9 months of aging

Study conducted with the Gironde Chamber of Agriculture at Château Dillon

Chemical Inertia

Compliance with EC1935/2004 and 2023/2006 regulations

Element	Max Limit Mg/L	Terracotta	Technical ceramic	Stoneware	Granite
Migration Analysis	0,9	0,26	0,32	0,31	0,21
Cobalt	0,02	ND	ND	ND	ND
Arsenic	0,002	Not Detected	ND	ND	ND
Plomb	0,15	< 0,015	< 0,015	< 0,015	< 0,015
Cadmium	0,01	0,005	< 0,002	< 0,002	< 0,005

Oenological Properties

	Terracotta	Technical ceramic	Stoneware	Granite
ABV (Total Alcohol by Vol.)	12,24	12,34	12,22	12,32
Volatile Acidity	0,44	0,45	0,43	0,43
PH	3,85	3,72	3,70	3,73
TPI (Total Polyphenols)	83	85	83	85
Anthocyanins ml/L	535	540	529	549
CO2 *	1313	1274	1469	1407

* CO2 plays a protective role responsible for carbonic maceration; it preserves the freshness and acidity of the wine. Thanks to its low thermal conductivity, ceramic helps retain this naturally occurring CO2, thus preserving the wine's liveliness and tension

The movement of the wine

• CELSIUS laboratory •

Each material has a different capacity to transmit the external temperature to what it contains. If the material transmits little or no external variations to its content, we say that it is insulating.

This ability to transmit or not transmit temperature is called thermal conductivity and it is expressed in watts per metre-kelvin ($\text{Wm}^{-1} \text{K}^{-1}$). Knowing this measurement is essential because it is the external variation of the temperature and its transmission - or not - to the liquid which will start the movement.

Here is the conductivity of the different materials usually used to contain wine :

Oak: 0.16 / Terracotta: 0.83 / Stoneware: 1.30 / Concrete: 2 to 5 / Stainless steel: 26

Sandstone and terracotta are therefore poorly conductive, so-called insulating materials.

Most fluids have a density which decreases with temperature. The colder a liquid is, the denser it will be.

In the presence of gravity (the force of attraction that sticks our feet to the ground), hot fluid is found above cold fluid. Thus, the surface water of lakes or the sea at rest is warmer than the water one metre deeper, and the air at ceiling level of a room is warmer than at floor level.

Therefore, for the movement of a liquid :

- **The temperature variation** outside the container is the energy given to the movement
- **Gravity** is the engine that allows liquidWs at different temperatures to move
- **The form is the accelerator or the brake.**

For there to be movement, there must be a change in temperature. If the cellar is perfectly insulated and heated/air-conditioned, there is no need to wait for the slightest movement since we are not giving the liquid energy to move. A temperature variation of 3°C , between the day and night for example, is sufficient to observe an interesting movement.

V&T AMPHORES used this 3°C gradient on stoneware jars to conduct a study on the movements of wine in different jar shapes by the Celsius laboratory, with the following results :

Shape of the V&T AMPHORES containers

Average speed in cm/day within the vessel, caused by a 3°C thermal gradient

Zen

Coralie

Ovo

Divine

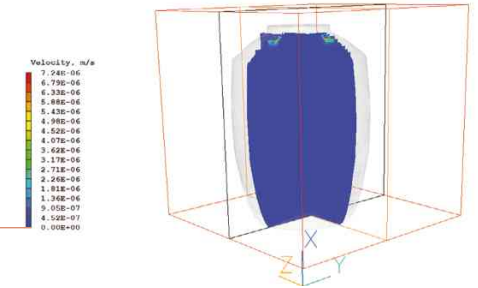
8

43

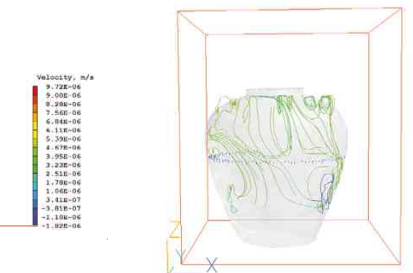
60

130

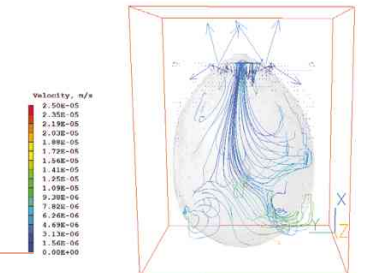
The angle on the top of the **Zen** acts as a brake and breaks the movement of the liquid inside the jar. With a Zen you will have very little movement and consequently a very straight, tight wine. This jar acts like a cocoon.



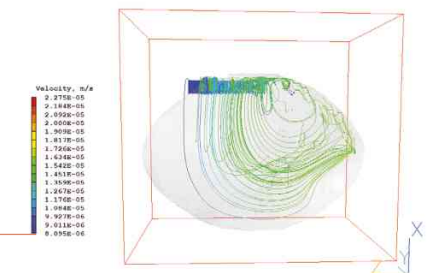
The rounded shoulders of the **Coralie** act as an accelerator and encourage a slight movement in random directions. This will bring roundness and fatness to the wine.



The **Ovo** allows mostly up and down movement with some random circulation. You'll have a quiet liquid with some uncertain agitation. If we were to compare the movement of the standing egg (Ovo) shape composed of other materials, we would have the following results : oak : 17cm/day | concrete : 52cm/day | stainless steel : 69cm/day



The **Divine** tank, with its elliptical shape, allows for speed propagation and therefore recirculation. Thanks to this movement, the liquid close to the wall is renewed allowing a little more interaction with the oxygen and the lees. Divine is the container that allows the most natural brewing.



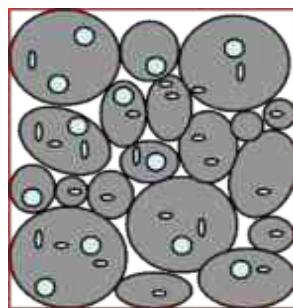
The porosity of our materials

Achieved in 2022 by the CALNESIS laboratory
on terracotta, stoneware and technical ceramic samples

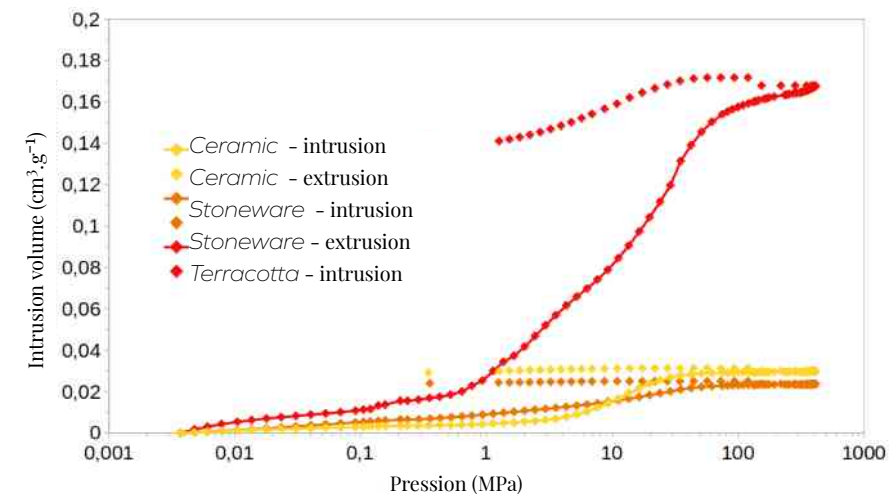
CALNESIS uses mercury, the only dense and remarkably mobile liquid metal with a non-wetting character, to introduce it into the selected material with a pressure ranging from 0.001 Mpa to 413 Mpa. (reminder: 0.1013 Mpa = average atmospheric pressure, 0.1 Mpa = 1 bar)

With mercury and such pressure, pore volume, porosity and pore size distribution can be well measured.

These intrusion volumes make it possible to define **a total porosity** of the material and approximately a porosity attainable by a liquid with its pressure in a neutral medium without other influencing parameters (temperature, humidity, fermentation gases, etc.)



Example and diagram
of the porosity
of a material



Mercury intrusion
and extrusion curves
for samples analysed
in this study

TABLE SUMMARISING THE DATA COLLECTED BY THE LABORATORY :

500 l 3 jars	Ceramic	Stoneware	Terracotta
Total porosity (A)	6,70%	5,60%	31,80%
Jar weight (B)	180 kgs	200 kgs	170 kgs
Density (pbulk g/cm3 at 0.004Mpa) (C)	2,24	2,37	1,89
Volume of jar material (B/C = D)	80,4 l	84,4 l	89,9 l
Total pore volume (air) (DxA =E)	5,39 l	4,73 l	28,59 l
Maximum volume of oxygen for 500l (oxygen/air Tx =21%) (E x 21% = F)	1,13 l	1 l	6 l
Oxygen mass (1.354) for 500 l * (F x 1.354 = G)	1500 mg	1400 mg	8100 mg
Oxygen rate per litre (G / 500 l)	3 mg / l	2,8 mg l	16 mg / l

*density of oxygen
at a temperature
of 15°

Terracotta contains potentially 5 times more oxygen than stoneware or technical ceramics.

Thanks to this high porosity, the terracotta jar allows more micro-oxygenation than stoneware or technical ceramics. **However, not all of this porosity is achievable** and the maximum solubility of oxygen in wine or water at a temperature of 15° is 10mg/ litre (winkler table).

What is surprising for an uninformed winemaker is the speed of dissolution of this available oxygen in the terracotta.

You will see in the following study how this oxygen is dissolved over time (7 months ageing).

The micro-oxygénation rate

V&T Amphores commissioned a study to characterise gas exchange through its jars.

The study began on 18/06/2021 at the experimental winery of the **CHAMBRE D'AGRICULTURE DE LA GIRONDE** in a climate chamber regulated at 16° with a hygrometry rate of 70%.

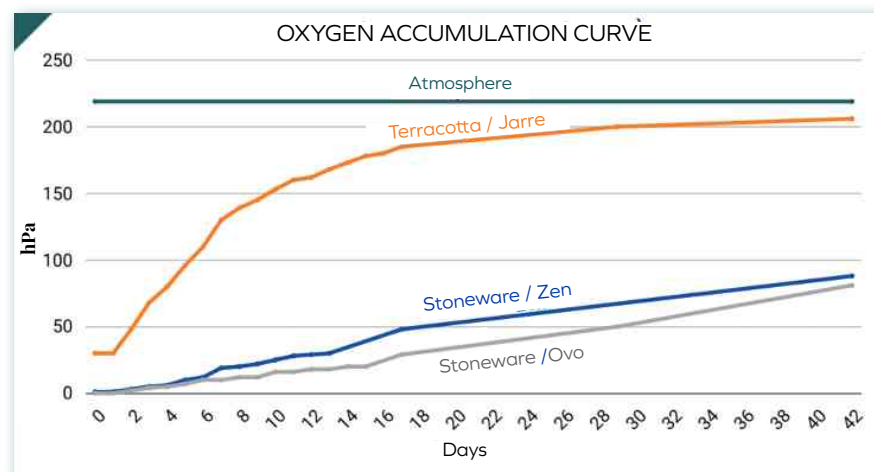
The first part of the test is carried out under nitrogen, the inside of the jars is cleaned of oxygen and then sealed. We wait for the return to equilibrium by taking measurements via probes placed in each container.

The second part of the test, lasting 7 months, consists of filling the jars with wine and monitoring its evolution.

The aim is to measure the precise **micro-oxygenation rate of each material (stoneware and terracotta)**.

When the jar is empty, the pores of the vessel walls fill with oxygen, which then enables the micro-oxygenation of the wine.

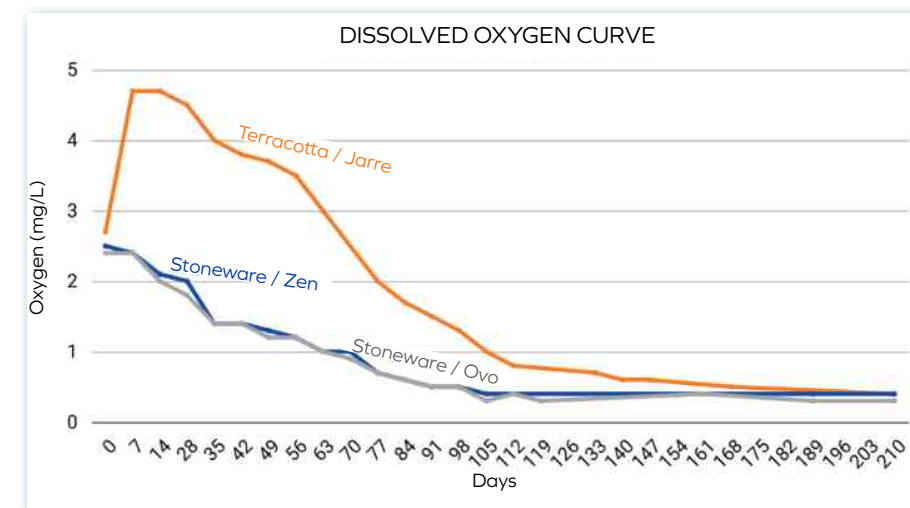
Results on
nitrogen
matrix



TERRACOTTA desorbs a lot of oxygen during the first 15 days (about 15 mg/L/month) and then stabilizes with an average rate of 1.5 mg/L/month. In the case of a wine that is going to consume this oxygen, we risk staying at a rate higher than 1.5 mg/L/month.

STONEWARE hardly desorbs oxygen and its oxygen transfer rate is stable at around 2.5 mg/L/month. This value is very close to the average value for a new barrel (1.8 to 2.3 mg/L/month).

Results
on wine
matrix



Conclusion

The study carried out with the Chamber of Agriculture has shown the behaviour of our materials with regard to their micro-oxygenating capacity.

TERRACOTTA is therefore significantly porous and allows the wines to open up and soften quickly. Consequently, its use requires close monitoring of the wines and adjustment of the ageing period for optimum results.

STONEWARE is a perfect complement because it desorbs little oxygen and micro-oxygenation remains diffuse and constant over time. The most fragile wines can be aged without the risk of premature maturation. The ageing periods can therefore extend from a few months to several years.

Despite the sometimes significant micro-oxygenating properties, it is very interesting to note that, in both cases, overprotection of the wines by increasing the SO₂ doses is not necessary.

Emissions CO₂

PRODUCTION

La terracotta is fired at 1000–1050 °C · Stoneware is fired at 1200 ° · Glass at 1400 - 1500 °

TERRACOTTA :	=62,8 g
STONEWARE :	=245 g
GLASS :	=345 g

Sources :
Transparencia.ascec.es/media/1099
site Express- May2015



TRANSPORT

CO2 Emission Comparison - one truck vs. one container for V&T AMPHORES :



A TRUCK typically carries :
20 jars of 300 kg each
= 6 tons

Example : Truck transport from Italy :
Florence - Bordeaux = 1,300 km

**A truck emits on average
79 g of CO₂ / tonne per km**

6 t x 79 g x 1300 km
= 616,2 kg

Per jar :
616.2 kg / 20 jars per truck
= 30.8 kg



A CONTAINER typically carries :
20 jars of 250 kg = 5 tons
10 jars of 150 kg = 1.5 tons
Total = 6.5 tons

Example : Container transport from China :
Chongqing-Bordeaux = 12,600 km

**A container emits on average
7 g of CO₂ / tonne per km**

6,5 t x 7 g x 12 600 km
= 573 kg

Per jar :
573 kg / 30 jars per container
= 19.1 kg

Sources : Emission factors for road transport were obtained from the ADEME database on emission factors for different road transport modes ("Etude - Facteurs d'émissions des différents modes de transport routier", available on data.gouv.fr). Factors for maritime transport (container ships) are derived from methodologies published by Clean Cargo and integrated into the GLEC Framework.
Other sources: Polytechnique insights - Comment réduire l'empreinte carbone du fret maritime. by Eric Foulquier, research lecturer, and Anaïs Maréchal, science journalist. - May 4, 2022





Strategic investment

Acquiring a jar means transforming an initial cost into a long-term strategic investment.

Example of amortisation :

The purchase of a Zen stoneware amphora, 1,200 L,
Designed to last several decades, it requires only minimal maintenance - cleaning with oxygenated water suffices.

- **Jar price : 4, 200 € HT**
- Fully equipped.
- Jar volume : 1,200 L
- ~ 1,600 × 75 cl bottles produced

Net margin per bottle	Number of bottles to sell to recoup the investment
3€	1,333
5€	800
7€	570

Four pillars of strategic value :

Acquisition

A rate of €3.50/L for our ZEN 12 hL in stoneware VS over €4/L for a new barrel.

Exceptional durability

The investment amortised over several decades. No need to be renewed every 3-5 years.

Energy efficiency

Natural thermal inertia reduces temperature regulation costs.

Product integrity

The use of crystalline and inorganic materials limits recourse to corrective chemical additives.

Financing without constraint

Finance lease :

Thanks to finance leasing (Milésime in France or other), start without any down payment with flexible rental payments.

Your return on investment ? 18 to 24 months maximum thanks to the value enhancement of your wines aged in amphora.

The winning calendar :

Juin : acquisition.....
-> Septembre : harvest
.....
-> 6 to 14 months of ageing on average
.....
-> Early Year N+1: commercialisation

Other financing solutions

Beyond leasing, a wide range of public funding mechanisms exist to support your investment. Most governments and agricultural institutions offer grants or subsidised loans for winery equipment, typically covering 30 to 40% of the investment, with enhanced rates for young farmers.

In the European Union, national CAP Strategic Plans (EAFRD) finance cellar investments across all member states.

Outside Europe, equivalent programmes exist through the USDA (USA), Wine Australia, and national rural development agencies worldwide.

Agricultural banks and specialist lenders,

including Farm Credit networks, Rabobank, and regional agri-finance institutions — offer loan products tailored to the wine sector.

Agricultural crowdfunding platforms provide an additional route to mobilise community-based funding.



Recongnition

by guides and competitions

Amphora ageing is today a genuine lever of distinction.

By prioritising fruit purity and aromatic precision, the cuvées of our clients regularly stand out in international competitions, oenological guides and the press.



Domaine des Anges



Château Doyac



Domaine du Vieux Pressoir



Domaine Santa Duc



Domaine de Chapital



Mas Du Novi



Domaine Nathalie Falmet

Testimonials

Gautier Roussille, Domaine Guillemot Michel :

We began using Vin et Terre jars in 2017, with a used 800L jar, for the fermentation and aging (11 months) of one of our Chardonnays. The result was so appealing that we now have 5 jars that improve year after year. Our Chardonnay in jars develops a great purity and a unique texture.

Thierry Thomas, Château Mas du Novi :

Vin et Terre represents authenticity and technicality ; or how to combine know-how with humanity... The stoneware jars represent a matrix of purity and finesse for very powerful wines. A rare vessel that combines thermal inertia and natural micro-oxygenation, resulting in wines full of precision and dimension [Stoneware Ovo].

Christophe Richomme, Laurent Collet, Champagne G. Richomme :

Le goût de l'expérimentation. Inspirés par l'innovation, nous aimons envisager de nouvelles techniques. Dernière en date : la vinification en jarre, rare en Champagne et encore peu courante en France, accueille une partie de notre vendange 2016. Une véritable première visant le développement des arômes du Champagne par le biais de la micro oxygénation naturelle du moût lors de la fermentation

Boris Générat, Distillerie des deux mers :

We are looking for a moderate, natural micro-oxygenation. The alcohol will remain clear. We already can't wait to let you taste this gem. Thanks to Vin et Terre for the horizontal [Lying] Ovos.

Clémence Pourtalès, Château Doyac :

Why the amphora ? Its porosity : the tannins soften, the wine mellows. Its inertia : the wine evolves slowly, which promotes the synthesis of fresh and fruity aromas. Its ovoid shape : it favors the suspension of fine lees and brings complexity and roundness to the wine. And they are magnificent !

Eddy Oosterlinck-Bracke, Domaine de Juchepie :

Vin & Terre is a reliable partner, and after 7 years of experience with their stoneware jars, we are convinced that they perfectly meet our expectations...It is fascinating to taste how the stoneware jar sculpts wines that are so different, but just as exciting as in barrels.

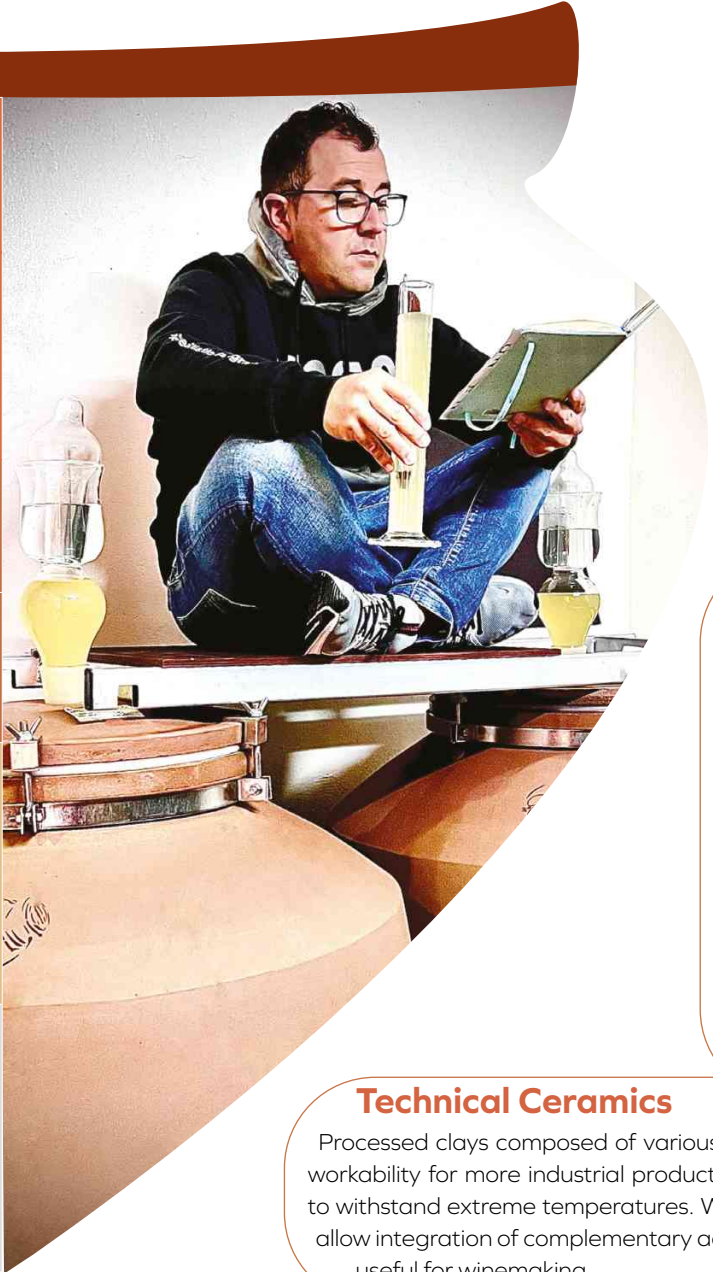
Barbara et Christophe Grellier, Brasserie des Voiron (craft brewery) :

We have owned the jars since 2017 and use them to produce our fruit- or plant-based beers. They make it easy to carry out macerations between our beer and the fruits or plants. They also provide gentle micro-oxygenation, bringing a certain acidity or tension on the palate. They are also practical in terms of cleaning and easy to maintain.

Domaine Béatrice et Pascal Lambert :

To vinify in amphora means using earth as a vessel, preserving the purity of the fruit while respecting the terroir. It brings together two natural soils: the clay of Tuscany and the clay or limestone soils of our Chinon vineyards. The amphora, a natural thermal regulator, gives rise to a new balance between wine and nature (...). Thanks to Patrick Lalanne of vinetterre.fr, who supplies us with these beautiful vessels along with invaluable advice.

The different ceramic bodies

			COOKING	POROSITY	COLOUR	
NATURAL CERAMICS	POROUS	Shard opacity Earthy fracture High porosity Difficulty to match with glaze T° enamel cooking < T° ceramic Low deformation	TERRACOTTA	900 C° to 1050 C°	8 to 30 %	Yellowish Red Brown
			FAIENCE	1050 C° to 1200 C°	5 to 12 %	Red Pink Beige Ecu
	VITRIFIED	Low porosity Deformation during cooking Scorching and cutting cracks	SANDSTONE VITREOUS	1100 C° to 1350 C°	0 to 6 %	Beige Ecu Brown
			PORCELAIN VITRO- PORCELAIN	1200 C° to 1400 C°	0 %	Ecu White
TECHNICAL CERAMICS	FIRECLAY	Resistance to temperatures Resistance to acidic and basic attacks Thermal shock resistance	FIRECLAY	1400 C° to 2000 C°	Various	Various
	SPECIALS	Resistance to electricity Inoxydable Resistance to temperatures and thermal shock Chemical resistance	SPECIAL CERAMICS	1400 C° to 3000 C°	Various	Various

Glossary

Clay : A sedimentary rock, often soft, which, when mixed with water, can form a more or less plastic paste that can be shaped and hardens when fired. When the firing temperature exceeds 600°C, clay transforms irreversibly into ceramic. A ceramist therefore creates their pieces using clay. Today, very few use earth dug near their workshop; most buy clay in 5 to 10 kg blocks from wholesalers. These suppliers blend different clays in precise proportions (much like a cooking recipe). The terracotta and stoneware jars selected by V&T AMPHORES are made by artisans who draw directly from quarries located near their workshops.

Ceramic : The name given to the discipline that manages the production of fired clay pieces. It is also the material from which these objects are made, but it also refers to the objects themselves. It is a generic term.

Natural Ceramics

- **Terracotta** • The raw material, clay, shaped and fired at temperatures above 600°C. It is the oldest form of fire art, which allowed the production of containers. Clay is fired at low temperatures: between 800 and 1020°C.
- **Stoneware** • As a category of ceramics, stoneware is made from clay with a high silica content (over 60%), known as “grès clay.” Stoneware clays are sedimentary and vitrify at around 1100°C to 1350°C. Firing gives them a very dense texture, making them impermeable, denser, and stronger than terracotta. Stoneware pottery does not require glaze or coating to be watertight.
- **Porcelain** • Fired at high temperatures (between 1200 and 1400°C), porcelain is a non-porous ceramic. It is mainly composed of kaolin. Porcelain clay contains no oxides (elements that give color to ceramic), which accounts for its brilliant whiteness.

Technical Ceramics

Processed clays composed of various materials, additives, or other agents. These pastes use less water and provide better workability for more industrial production. They allow control over specific properties such as density, porosity, and the ability to withstand extreme temperatures. While less “authentic,” they have their own advantages. Stronger and more uniform, they allow integration of complementary accessories in series, such as large, practical side doors for fermentation vessels, which are useful for winemaking.

Team

Our team puts all its expertise at your service to accompany you in the creation of exceptional cuvées, faithful to the expectations of your clients.



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Volga VORONOVSKAÏA
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Our representatives :

General terms and Conditions

Manufacturing Lead Times

Our jars are handcrafted. Their drying and firing processes in particular require significant production time. For customized pieces and items not in stock, please allow 3 to 5 months from the order date.

Delivery Conditions

All our deliveries are made by appointment. If delivery does not take place within the 2 months following the order while the jar is available, storage fees of €30/jar/month will be applied.

V&T Amphores reserves the right to apply additional charges to the cost of transport in the event of : absence at the delivery appointment; change of delivery address after the order has been placed ; or special request regarding transport equipment (lorry size, tail lift, etc.).

After-Sales Service (SAV)

V&T Amphores supports you from the choice of material to advice on maintenance after several years. We remain by your side throughout.



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A team always by your side

