OMW leather technology

OMW (OLIVE MILL WASTEWATER) TECHNOLOGY

From olive mill wastewater to leather

From the olive to leather.

A virtuous journey from waste to finished sustainable product.

OMW leather technology

A **new technology** from an
Italian source that is **revolutionising**
the **tanning process**

Oil and leather: two Italian excellences

Italy is one of the most important global producers of leather goods and the second largest producer of olive oil in the world.

Production volumes in Italy in 2024

95.4 million
m² of finished leather
(UNIC Sustainability Report – Italian Tanners' Association)

248,000
tons of olive oil
(ISMEA "Institute of Services for the Agricultural Food Market" data)

For several years now, the wastewater from olive oil processing has been studied for its antifermentative, antibacterial and antifungal properties. Research has explored its use as a stabiliser for natural matrices and has demonstrated its reactivity with leather proteins during the pickle phase.

Since 2020, in collaboration with Dermochimica, GSC Group has been developing a revolutionary project that enhances the tanning potential of olive mill wastewater, with the aim of increasing sustainability in the leather industry. GSC Group has developed a cutting-edge range of products and their related applications in the automotive, upholstery, footwear and leather goods sectors.

These innovative solutions constitute the OMW® Leather Technology.

OMW® | OMW leather technology

OMW® Leather Technology is a registered and legally protected trademark. The application process of the OMW® Leather Technology is covered by international patent EP3494237.

PATENTED

OMW leather technology

- What is OMW?
- A problem not to be underestimated!
- OMW by the numbers
- From waste to resource

The raw material at the heart of this technology comes from a by-product of the olive oil industry which, if released into the environment, would be polluting.

What is OMW?

The olive oil extraction process begins at the mill, with the washing of the olives to remove impurities such as dust and leaves. The olives are then crushed, separating the pulp from the pits and peels, resulting in an oily paste made up of pulp, pits, peels, water, and other substances.
The paste is then subjected to a slow mixing process to promote the aggregation of oil droplets, making their extraction easier.

The next stage is the separation of the oil through centrifugation. This process generates two fractions: the oil, the final product, and a waste by-product consisting of washing water from the olives, water used to recover the residual oil, water for diluting the paste, and the aqueous fraction derived from the juices of the pulp and pit.

This wastewater is called Olive Mill Wastewater (OMW). Although it is free from pathogens, heavy metals, and viruses, OMW is among the most polluting agro-industrial wastewaters due to its high organic load and the soluble compounds it contains.

OMW

A problem not to be underestimated!

OMW is harmful to the environment due to its high acidity and its antimicrobial and phytotoxic properties, which are linked both to the high organic content and the excessive presence of polyphenols, known for their low biodegradability.

Improper disposal on the surface can lead to environmental damage, such as the contamination of surface and groundwater and a reduction in soil fertility.

In Italy, according to current regulations, OMW may only be discharged into the environment in minimal quantities and must be treated in wastewater treatment plants.

Uncontrolled spill on a field

OMW by the numbers

100 Kg
of olives

18/22 Kg
of olive oil

50/80 Kg
of Olive Mill Wastewater (OMW)

OMW is a problem not to be underestimated, also because it is produced in large quantities.

From 100 kg of olives, the average yield is:

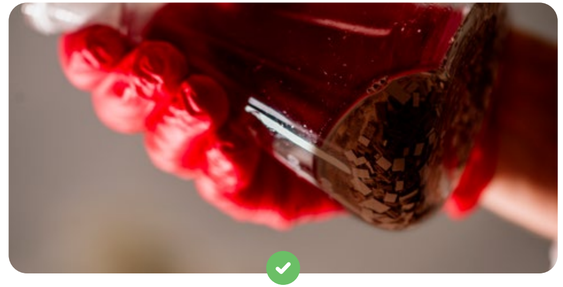
18–22 kg of olive oil
50–80 kg of Olive Mill Wastewater (OMW)

Each year, approximately 4 million tonnes of OMW are produced in Italy.(Source: ENEA – Italian National Agency for New Technologies, Energy and Sustainable Economic Development)

What the OMW® Leather Technology Project Proposes

To date, almost all of the OMW produced in olive mills follows a single route: it is sent to wastewater treatment plants for disposal. Our project, however, opens up a new path.

By transforming OMW from waste into a resource, we eliminate the need for direct disposal in treatment facilities. The wastewater is treated, concentrated, and polymerised through a patented process. In this way, it becomes a tanning agent that is incorporated into a more complex formulation, used in the tanning cycle for the production of metal-free leather.

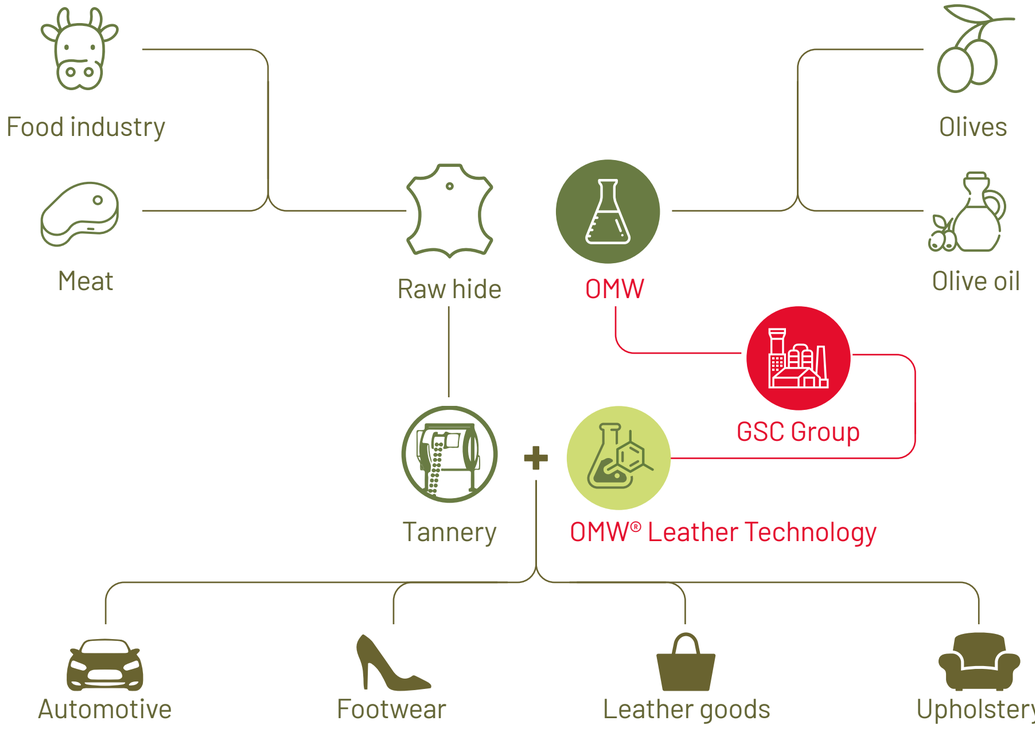


From Waste to Resource

The main phenolic compounds present in OMW are:

> hydroxytyrosol
> tyrosol
> catechol
> methylcatechol
> oleuropein
> caffeic, gallic, vanillic and coumaric acids

which have extraordinary antioxidant properties.
Tannins with tanning action are also present.



OMW leather technology

- OMW Leather
- Physical and chemical properties
- Biodegradability and compostability
- The tanning bath

OMW leather not only features excellent physical and aesthetic properties, but is also fully compliant with all industry safety standards.

OMW Leather

Leathers tanned with OMW® Leather Technology are metal-free and suitable for a wide range of applications, including fashion, upholstery, and automotive. They guarantee high-level performance and characteristics comparable to traditional tanning in terms of strength, durability, and aesthetic quality.

Characteristic of leathers tanned with **OMW® Leather Technology** compared to **chrome** and **glutaraldehyde** tanned leathers

Standard	Property	OMW® Leather Technology	Glutaraldehyde	Chrome
ISO 3380	Shrinkage temperature	70/75°C	73/78°C	100°C
ISO 17228	Fastness to heat	Good	Average	Excellent
ISO 3377-2	Tear strenght	Excellent	Average	Excellent
UNI EN ISO 17226-1: 2021	Formaldehyde content	Compliant	Compliant	Compliant
ISO 105 B06 (Automotive)	Fastness to light	Good	Average	Excellent
UNI EN ISO 17072	Presence of heavy metals	Not present	Not present	Present

Analysis of tanning bath discharges comparison: **OMW® Leather Technology** - **glutaraldehyde** - **chrome** tanned

Type of Tanning	Phase	COD Waters	Total Chrome	Sulphates
OMW Leather Technology	Tanning	15,164 mg eq. o2/l	0	4,075 mg/l
Glutaraldehyde	Tanning	17,900 mg eq. o2/l	0	3,557 mg/l
Chrome salts	Tanning	9,611 mg eq. o2/l	8,294 mg/l	36,011 mg/l

Biodegradability of leather tanned with OMW® Leather Technology

Samples	Average relative biodegradability (%)
Leather tanned with OMW® Leather Technology	96
Leather tanned with glutaraldehyde	85
Leather tanned with chrome	79

Method: UNI EN ISO 20136:2020 – Leather: Determination of degradability by micro-organisms

Study on the compostability of leather treated with OMW® Leather Technology

Species	Sample concentration (% w/w)	Germination (%)	Wet biomass (%)	Dry biomass (%)
Hordeum vulgaris (barley)	[25%]	98.3	91.2	97.7
	[50%]	100	99.5	98.9
Lepidium sativum (watercress)	[25%]	100	110	103
	[50%]	100	113	103

Disintegration of 99.2% through a 2 mm sieve according to ISO 14045:2003

Conclusion

OMW® Leather Technology represents a more responsible industrial process, capable of meeting the needs of a constantly evolving market and offering companies a competitive advantage. Combining innovation and environmental respect without compromising on the quality of the final product, this technology represents a forward-thinking choice for the future of the leather industry.

1 OMW® Leather Technology is synonymous with circular economy and aims at sustainability.

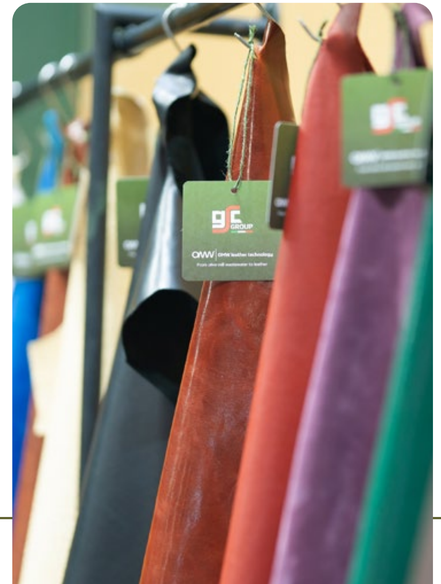
OMW tanning agents are derived from a by-product of the food industry and applied to the leather industry, which in turn makes use of hides – a waste product of meat production. In this way, **the environmental impact of tanning processes is improved**, promoting, for example, the **compostability of leather**.

2 Leather tanned with OMW is more environmentally friendly and healthier for humans.

Processing with OMW® Leather Technology ensures the protection of the environment and human health. It is **free from the risk of hexavalent chromium** formation.

3 OMW® Leather Technology follows the principle of a short supply chain and is entirely Made in Italy.

Its tanning agents are produced in Italy through an exclusive process that uses OMW from Italian olive oil mills, mainly located in Tuscany and Apulia.



From the olive to leather.
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Scan the QR code
to watch the dedicated video

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In collaboration with DERMOCHIMICA

ISO 14064-1 BUREAU VERITAS Certification

Verification Statement IT336491-1 dated 15/10/2024 concerning the GHG inventory issued by Bureau Veritas for the calendar year 2023