

OBJECTIVES

OLIVE-SOUND aims to develop an Ultrasonic (US) reactor for the treatment of olive paste which enhances the working capacity of existing olive mills. It reduces malaxation time, the current bottleneck in olive oil extraction, by 70% and hence reduces energy usage by 65%. At the same time, it increases extraction yield by 5-6%, improves olive oil quality (by increasing the phenolic compounds content) and reduces investment costs by over 50%, compared to a traditional malaxation system.

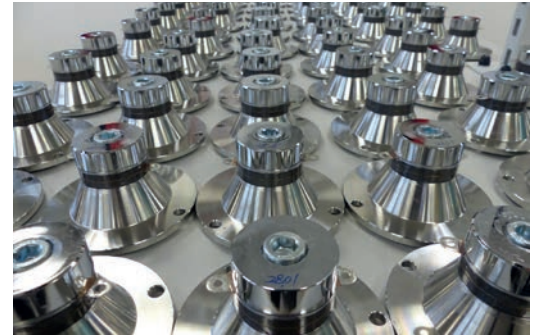


Fig. 1: US transducers ready for mounting.

WHY OLIVE SOUND?

Virgin olive oil (VOO) is the olive oil obtained directly from olives and solely by mechanical means. VOO is mainly exported from Mediterranean regions as 98% of the world’s olives are harvested in this area. The European Union is the leading producer, accounting for 71% of the world’s olive oil. There are 2.5M olive oil producers, who make up roughly one-third of all EU farmers.

TECHNICAL PRINCIPLE - ULTRASOUND EFFECT IN THE VOO EXTRACTION PROCESS.

When high power US (<25kHz) is applied to liquids (olive paste), the sound waves propagate into the medium, resulting in alternating high pressure (compression) and low-pressure (rarefaction) cycles, with rates that depend on the frequency.

During low-pressure, high intensity ultrasonic waves create small vacuum bubbles in the liquid. When the bubbles can no longer absorb energy, they collapse violently, this phenomenon is termed cavitation.

US poses a unique opportunity to revolutionize the VOO elaboration process through its mechanical and thermal effects. As an acoustic wave, US propagates through the plant tissue. Part of it is absorbed and converted to heat. US mechanical action is due to the cavitation phenomena, which cause the cell walls of vegetal tissue to break and release cellular content, including olive oil and minor compounds, accelerating the oil extraction process.

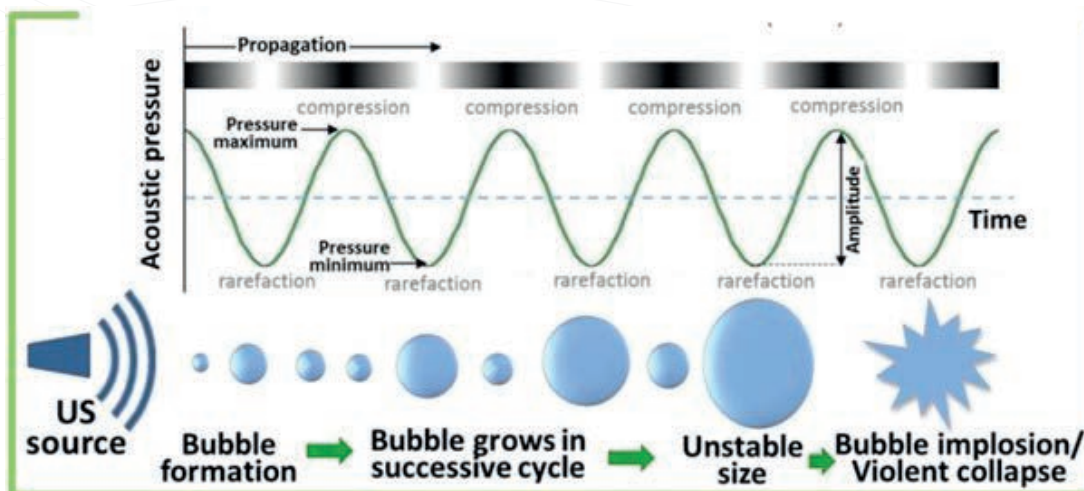


Fig. 2: Principle of US operation.

PARTNERS

The OLIVE-SOUND Project brings together an expert team with extensive complementary knowledge and technical capabilities in the fields of olive oil extraction and US applications:

- **PIERALISI** (Italy) is the world’s leading manufacturer and seller of machinery for olive processing, with more than 60 years of experience in the sector.
- **CEDRAT TECHNOLOGIES** SA (France) is a high-tech SME experienced in designing and manufacturing innovative sonic and ultrasonic transducers and associated electronics.
- **UNIVERSITY OF BARI** (Italy) and its Interdisciplinary Department of Medicine has an extensive research experience in the implementation of emerging technologies in the olive oil sector.
- **AIDISA** (Spain), a non-profit association of SMEs, manages **Ctic Cita**, a union of Innovation and Technology centres that offers specialized, technologically advanced services to food. Ctic Cita has considerable experience in the management of national and European projects.
- **ALMAZARA DEL EBRO** (Spain) is a cooperation of olive oil producers located in Navarra.



Fig. 3: Command/control electronics, drivers and three US vessels each fitted with 60 transducers.



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