



**MILESTONE**  
H E L P I N G  
C H E M I S T S



**HIGH QUALITY  
EXTRACTS**  
WITH A GREEN PROCESS



**ETHOS™ X line**

Microwave Green Extraction of  
Natural products for Enhanced Production



# ENHANCING PRODUCTION CAPACITY WITH GREEN EXTRACTION

The use of microwave technology for solvent-free extraction from botanical material was pioneered by Milestone years ago, with the ultimate goal to offer a more up-to-date and “green” approach to this application. The innovative microwave process has been adopted by several industries, gradually moving from research labs to production plants. Milestone’s long-standing commitment to this technology has now led to the ETHOS X 2.0 and ETHOS XL, two dedicated solutions for craft applications as well as medium and large-scale processors. Both incorporate the solvent-free and green approach whilst significantly enhancing the production capacity. Thanks to the ETHOS X 2.0 and ETHOS XL processors can now rely on:



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HIGHER EXTRACT QUALITY

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FASTER EXTRACTION PROCESS

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NO BY-PRODUCTS

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NO SOLVENT REQUIRED

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ZERO PURIFICATION

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## I MILESTONE GREEN TECHNOLOGIES

The technology of the ETHOS X family embraces the values and benefits of the green extraction approach. It does not require the addition of chemical solvents it enhances the heating efficiency and avoids the creation of by-products. Other extraction techniques rely on the use of large volume of solvents and require intense purification. The patented microwave approach maintains the integrity of the essential oils' profile, providing superior freshness of flavour.



# THE IDEAL TOOL TO EXPAND YOUR CRAFT PRODUCTION



## **High efficiency**

The two condensers with the dedicated burette, ensure complete condensation, reflux of the water into the reactor and fast separation of the oils.

## **Enhanced reproducibility**

The ETHOS X uses an accurate temperature sensor, fully controlled through the user-interface. It controls the distillation flow and ensures faster extraction processes.

## **Full control**

The dedicated user-interface controls the extraction parameters, ensuring a high level of safety. The built-in methods facilitate its implementation into the workflow.

## **Great capacity**

The 15 L reactor accommodates large quantities of material. The design guarantees simple handling and a quick swap of reactors between runs.

## **Fast extraction**

The ETHOS X 2.0 offers high microwave power in combination with a rotating reactor to expedite the extraction process and ensure even heating. A typical process takes between 60 and 90 minutes.

## ETHOS X 2.0 WORKFLOW

The ETHOS X 2.0 has been designed with the aim to simplify the extraction process for craft applications and medium level commercial companies. The sequence of operation starts by placing botanical material into the large reactor (15 L) and in just a few seconds the extraction process begins. The high microwave energy allows for a quick evaporation of the compounds along with the water content of the plant material. The temperature sensor ensures a proper distillation flow, so that the oils and water re-condense into a dedicated water-cooled apparatus where they are separated into two phases based on their different density. The oils can then be easily collected into a dedicated flask.



*Reactor loading*



*Microwave program*

### ETHOS X 2.0 TECHNICAL DETAILS

Material type: **Fresh and dry**

Typical weight per run: **Few kilograms**

Heating type: **Microwave (1800 W)**

Condensation module: **Two condensers**

Cooling system: **External water chiller (2000 W)**

# ENHANCING PRODUCTION CAPACITY OF PREMIUM PRODUCTS



## Reliable yield and quality

The distillation flow temperature sensors are in a continuous dialogue with the user-interface to control the extraction process which results in a high yield and quality of the extract.

## Full control

The advanced user-interface enables the precise control of the extraction parameters and ensures full traceability of the process.

## Highest production capacity

The 45 L rotating drum accommodates large volumes of samples for larger scale oil production. The built-in water bath along with the rotating mechanism improve the extraction efficiency and the quality of the oils.

## Hybrid power

The combination of microwave and conventional heating results in a short extraction process. While microwaves act directly on the botanical material, the heating pads on the cavity walls shorten the warm up time of the system and facilitate the distillation flow.

## Industrial design

The ETHOS XL has been built to be integrated into the processor's workflow. Its semi-automated process and the straightforward handling make it the perfect fit for intense use.

## ETHOS XL WORKFLOW

The ETHOS XL has been designed to process large volumes of botanical material through a simplified workflow. The process starts with the loading of the material into bags and then into the drum of the system. The system then automatically loads the water into the bottom of the cavity and starts the heating process. The high microwave power along with the dedicated heating pads ensure that the distillation conditions are quickly reached. The temperature sensor controls the entire process to maximize the extraction efficiency and to ensure reproducibility. At the completion of the run, the extracts are being separated from the water in the dedicated burette, so that the operator can easily collect the extract.



*Bags loading*



*Microwave program*

### ETHOS XL TECHNICAL DETAILS

Material type: **Fresh and dry**

Typical weight per run: **Multiple kilograms**

Heating type: **Microwave (4500 W) plus conductive heating (1800 W)**

Condensation module: **Four condensers**

Cooling system: **External water chiller (7000 W)**

# MILESTONE HELPING CHEMISTS

Established in 1988, Milestone is headquartered in Italy and has offices in Germany, Switzerland, the United States, China, Japan and Korea. We operate worldwide through a network of over 100 exclusive distributors, all providing our customers premium application and service support. Milestone has been active in the microwave technologies since three decades and it pioneering the green extraction from natural products using microwave technology. Our industry-leading technology, in combination with fast, responsive service and applications support, allows Milestone to support our goal of providing you the highest return on investment possible.

WWW.MILESTONESRL.COM

## MILESTONE



HELPING  
CHEMISTS

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