



**MACH**  
TECHNOLOGIES

**Thomas**  
Scientific

MACH Technologies is a US manufacturer of cutting-edge extraction equipment, processes and technologies. Our products are designed for safety, efficiency, throughput, and ease of use. We are a homegrown team of mechanical, chemical, electrical, and controls engineers—ensuring your equipment and processing systems are of superior quality. Proudly serviced, supported and MADE in Michigan.



# ETHANOL EXTRACTION SKIDS

**EES**  
SERIES

## A COMPLETE PROCESS FROM A SINGLE OPERATOR

The EES Series offers complete process automation from ethanol chilling, extraction, recirculation, and filtration (with optional solvent recovery & decarboxylation) by a single operator interface. These turnkey systems offer the latest technology to ensure consistent and repeatable extraction process, driven by system efficiencies and automation. EES skids come in a variety of sizes to best suit your extraction needs.



**EES-X-144**

| THOMAS NO. | MFR. NO.   | CAPACITY   |
|------------|------------|--|
| 22A00B532  | EES-X-144  | Up to 144 LBS / DAY (Based on 48 lbs per 8hr shift)      |
| 22A00B533  | EES-X-900  | Up to 900 LBS / DAY (Based on 300 lbs per 8hr shift)     |
| 22A00B534  | EES-X-1800 | Up to 1,800 LBS / DAY (Based on 600 lbs per 8hr shift)   |
| 22A00B535  | EES-X-3000 | Up to 3,000 LBS / DAY (Based on 1,000 lbs per 8hr shift) |



**DIRECT-CONNECT**  
REMOTE SUPPORT FOR  
YOU AND MACHINE



**EES-X-1800**

**EES-X-900**



**EES-X-3000**



## STAND ALONE CENTRIFUGE EXTRACTION

### CES SERIES



UP TO 98% BOTANICAL COMPOUND REMOVAL



UP TO 97% ETHANOL REMOVAL FROM BIOMASS



SINGLE OPERATOR CONTROL SYSTEM



CES-80

The MACH Technologies CES model centrifuge extraction system is a high efficiency, centrifuge style extraction system designed for use in both warm and cryogenic ethanol extraction. The MACH CES series is operated from a C1 D2 rated HMI (Human Machine Interface), and has specialized features such as a double jacketed extraction vessel, specialized extended bearing centers for ultimate equipment robustness and a recipe driven MACH proprietary control system which makes the MACH CES series the most efficient and robust, MADE IN AMERICA centrifuge extraction system available.

| THOMAS NO. | MFR. NO. | CAPACITY  | AVERAGE RECIPE RUN TIME | ETHANOL REQUIRED PER RUN          | ELECTRICS                |
|------------|----------|---|-------------------------|-----------------------------------|--------------------------|
| 22A00B528  | CES-80   | Up to 2.5 LBS<br><i>(depending on input material mill size)</i> | 12-15 MINUTES           | 2-2.5 GALLONS <i>(on average)</i> | 480V/3PH/60HZ OR 220/1PH |
| 22A00B529  | CES-300  | Up to 13 LBS<br><i>(depending on input material mill size)</i>  | 12-15 MINUTES           | 12-14 GALLONS <i>(on average)</i> | 460V/3PH/60HZ, 10 FLA    |
| 22A00B530  | CES-600  | Up to 30 LBS<br><i>(depending on input material mill size)</i>  | 12-15 MINUTES           | 27-32 GALLONS <i>(on average)</i> | 460V/3PH/60HZ, 10 FLA    |
| 22A00B531  | CES-1000 | Up to 50 LBS<br><i>(depending on input material mill size)</i>  | 12-18 MINUTES           | 45-55 GALLONS <i>(on average)</i> | 460V/3PH/60HZ, 17 FLA    |



CES-300



CES-600



CES-1000



## ETHANOL CHILLING SYSTEMS

## MST | MDT SERIES



Continuous Ethanol Chilling



Small Footprint



Great System Efficiency Over Recirculation Batch Systems



Jacketed Cold Ethanol Storage Tank

The MACH Technologies MST & MDT series are specialty designed ethanol chilling systems. The systems cool ethanol from room temperature (65F) to negative 40 (-40F) at a flow rate per below depending on the model selected. Both units come with an integrated control panel which is mounted outside the classified area for operation of the unit. The ancillary ULT (ultra-low temperature) chiller is typically mounted outside the classified area, either indoors or outdoors depending on the model selected.

| THOMAS NO. | MFR. NO. | GPH of ETHANOL CHILLING |
|------------|----------|-------------------------|
| 22A00A940  | MST-50   | 50 GPH                  |
| 22A00A941  | MST-75   | 75 GPH                  |
| 22A00A942  | MST-135  | 135 GPH                 |

| THOMAS NO. | MFR. NO. | GPH of ETHANOL CHILLING |
|------------|----------|-------------------------|
| 22A00A943  | MDT-50   | 50 GPH                  |
| 22A00A944  | MDT-75   | 75 GPH                  |
| 22A00A945  | MDT-135  | 135 GPH                 |

\*Other capacities available upon request.



### MST SERIES INCLUDES

- Ethanol Feed Pump
- Cooling Unit
- Internal Piping
- Cold Ethanol Storage Tank with Frame
- Cold Ethanol Gravity Discharge (Optional Pump Discharge also available)



### MDT SERIES INCLUDES

- Room Temperature Ethanol Storage Tank
- Ethanol Feed Pump
- Cooling Unit
- Internal Piping
- Cold Ethanol Storage Tank w/ Frame
- Cold Ethanol Discharge Pump
- Integrated Tank Level Controls
- Temperature Control Units (For Greater System Control and Automation)

## PFS SERIES

## PARTICLE FILTRATION SYSTEMS

### AVAILABLE IN 2,3,4 FILTER HOUSING CONFIGURATIONS

The MACH Technologies particle filtration systems are designed to filter the semi saturated solution after the initial extraction process and capture particulate that made it through the primary extraction filter bags. These systems are available in a variety of configurations and are manufactured to sanitary standards. The MACH sanitary design allows for easy and quick filter changeover and incorporates drain valves for each housing. The filters are mounted to a polished stainless-steel frame with foot pads that can be fastened to the floor.



Available in 2,3,4 Filter Housing Configurations



Optional Lenticular Filters Available



Direct Connection to the MACH CES Series Centrifuges



Differential Pressure Gauges on Filters



Available with Optional Feed Pumps if Auto Discharge Kit Not Included on MACH CES Centrifuge



Flow Rate Up to 40 GPM





## DECARBOXYLATION REACTOR SYSTEMS

### DS SERIES



**DS-5050**



**DS-20**

### COMPLETE SPECIALIZED DECARBOXYLATION REACTOR PACKAGES

The MACH Technologies DS Series decarboxylation reactor systems are complete specialized decarboxylation reactor packages with ancillary equipment. MACH offers stainless steel reactors as a standard (but can also provide glass upon special request). The DS series are available in single or dual reactor configurations with the capacities listed below. Each reactor is double jacketed and includes an independent industrial mixing unit with variable RPM control for the impeller, and independent temperature control systems for heating the reactor. The system includes a vacuum pump, and the control system for a seamless integration and superior process control.

| THOMAS NO. | MFR. NO. | CAPACITY (LITERS)   |
|------------|----------|---|
| 22A00A948  | DS-20    | 20 Liters (16-liter max fill)                                     |
| 22A00A949  | DS-2020  | 20 Liters (16-liter max fill) per reactor, system total 40 liters |
| 22A00A950  | DS-50    | 50 Liters (40-liter max fill)                                     |
| 22A00A951  | DS-5050  | 50 Liters (40-liter max fill) per reactor, system total 40 liters |

#### INCLUDED ANCILLARY EQUIPMENT



Reactor Heating System



Vacuum Pump

### ASR SERIES

## AUTOMATED SOLVENT RECOVERY

### COMPLETE TURNKEY SOLVENT RECOVERY SYSTEM

The Automated Solvent Recovery series is a high efficiency, high throughput solvent recovery system specifically designed for the hemp and cannabis industry. The system takes the incoming ethanol/oil stream from either a previous ethanol extraction process or a winterization process and produces two output streams which are (1) recovered ethanol and (2) concentrated oil. The MACH ASR is a complete turnkey setup which includes an ethanol/oil incoming buffer holding tank, complete solvent evaporation & condensing columns, automatic controls for system temperature, pressure, fluid levels, along with automated discharge of recovered ethanol and concentrated oil via specialized, variable speed drive pumps.

#### INCLUDED ANCILLARY EQUIPMENT



Chiller



Heating System



Vacuum Pump



**ASR-20**



**ASR-60**



## MODULAR EQUIPMENT ENCLOSURES

### TURNKEY MODULAR ENCLOSURES

MACH Technologies modular enclosures are designed and manufactured to create either a Class-1 Division-1 or Class-1 Division-2 environment inside the unit. This is commonly used for hydrocarbon extraction equipment, as that solvent (hydrocarbon) requires a Class 1 Division 1 rating. The EE-1 series is a turnkey unit and includes the modular structure, Class 1 Division 1 electronics such as LED lighting, a LEL calibrated for hydrocarbon, an integrated air flow plenum and fan, and buzzer and light signal devices.



CLASS 1 DIVISION 1 LED LIGHTING, BLOWERS, AND SIGNAL DEVICES

| THOMAS NO. | MFR. NO.    | DIMENSIONS         | THOMAS NO. | MFR. NO.    | DIMENSIONS         |
|------------|-------------|--------------------|------------|-------------|--------------------|
| 22A00A952  | EE-1-101010 | 10'W x 10'L x 10'H | 22A00A953  | EE-1-101012 | 10'W x 10'L x 12'H |
| 22A00A955  | EE-1-102010 | 10'W x 20'L x 10'H | 22A00A956  | EE-1-102012 | 10'W x 20'L x 12'H |
| 22A00A963  | EE-1-202010 | 20'W x 20'L x 10'H | 22A00A964  | EE-1-202012 | 20'W x 20'L x 12'H |
| 22A00A957  | EE-1-162510 | 16'W x 25'L x 10'H | 22A00A958  | EE-1-162512 | 16'W x 25'L x 12'H |
| 22A00A959  | EE-1-163010 | 16'W x 30'L x 10'H | 22A00A960  | EE-1-163012 | 16'W x 30'L x 12'H |
| 22A00A961  | EE-1-163810 | 16'W x 38'L x 10'H | 22A00A962  | EE-1-163812 | 16'W x 38'L x 12'H |



INTEGRATED LEL SOLVENT DETECTION SYSTEM



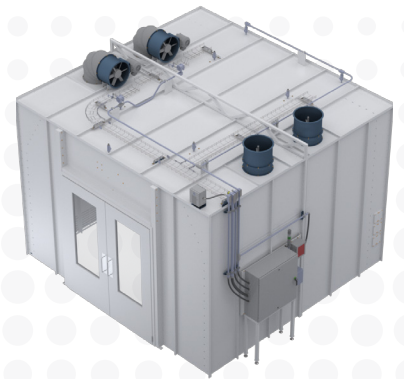
INTEGRATED AIR FLOW PLENUMS AND BLOWERS



UL508A CONTROL PANEL



MODULAR CONSTRUCTION FOR QUICK AND EASY SETUP

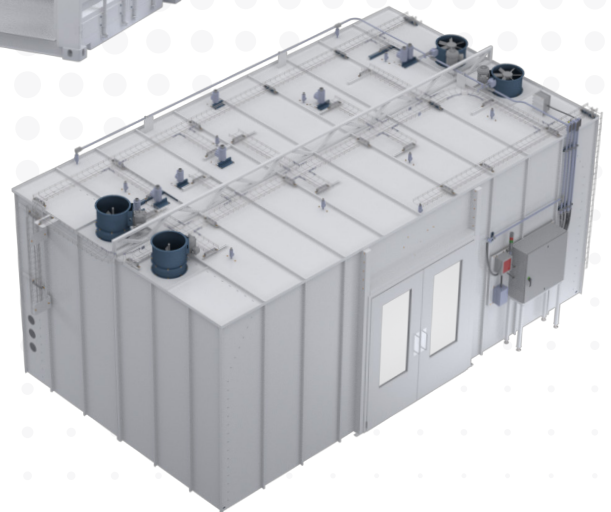


### EE-2 SERIES



CLASS 1 DIVISION 2 LED LIGHTING, BLOWERS, AND SIGNAL DEVICES

| THOMAS NO. | MFR. NO.    | DIMENSIONS         | THOMAS NO. | MFR. NO.    | DIMENSIONS         |
|------------|-------------|--------------------|------------|-------------|--------------------|
| 22A00A965  | EE-2-101010 | 10'W x 10'L x 10'H | 22A00A972  | EE-2-101012 | 10'W x 10'L x 12'H |
| 22A00A967  | EE-2-102010 | 10'W x 20'L x 10'H | 22A00A973  | EE-2-102012 | 10'W x 20'L x 12'H |
| 22A00A968  | EE-2-202010 | 20'W x 20'L x 10'H | 22A00A974  | EE-2-202012 | 20'W x 20'L x 12'H |
| 22A00A969  | EE-2-162510 | 16'W x 25'L x 10'H | 22A00A975  | EE-2-162512 | 16'W x 25'L x 12'H |
| 22A00A970  | EE-2-163010 | 16'W x 30'L x 10'H | 22A00A976  | EE-2-163012 | 16'W x 30'L x 12'H |
| 22A00A971  | EE-2-163810 | 16'W x 38'L x 10'H | 22A00A977  | EE-2-163812 | 16'W x 38'L x 12'H |





## HYDROCARBON EXTRACTION SYSTEMS

### HES SERIES



MHES-5

### HYDROCARBON EXTRACTION

The MACH Technologies MHES system is a specialized hydrocarbon extraction system. The MACH MHES unit is designed with ASME code stamped vessels designed to be able to run 100% propane, 100% butane, or a blend. The MHES system is fully engineered and manufactured in Michigan. The unit offers an oversized solvent holding and collection tank to allow for an industry leading solvent to flower ratio (10:1) to produce a superior output product with up to 95% extraction efficiency. MACH MHES is industry leading when it comes to solvent ratio ability, passive recovery rates, and manufacturing quality. The MACH passive recovery system means no expensive pumps to purchase or maintain and no moving parts for a lower total cost of ownership.

| THOMAS NO. | MFR. NO.   | MHES-5      |
|------------|------------|-------------|
| 22A00A979  | CAPACITY   | Up to 5 LBS |
|            | CYCLE-TIME | TBD         |
|            | ELECTRICS  | TBD         |

### TES SERIES

## SOLVENTLESS TERPENE EXTRACTION

### FULLY AUTOMATED SOLVENTLESS TERPENE EXTRACTION

The MACH Technologies TES Series is a specialized, fully automated solventless terpene extraction machine that will remove the terpenes from the plant material and separate them from cannabinoids. "True Spectrum" profiles replicates the exact smell and flavor of the cultivar. Through specialized and automated process control, the MACH solventless terpene extraction system does not decarboxylate the material and is designed as a front-end process to be used prior to the MACH solvent-based extraction systems.



TES-20

REV4/6/22

| THOMAS NO. | MODEL      | TES-20                      |
|------------|------------|-----------------------------|
| 22A00A978  | CAPACITY   | Up to 20 LBS                |
|            | CYCLE-TIME | 2 Hr Distillation (Typical) |
|            | ELECTRICS  | 480v/3PH/60Hz               |