ETHOS UP
TECHNICAL SPECIFICATIONS

MILESTONE
HELPING CHEMISTS

HARDWARE

- Microwave cavity: 316 stainless steel housing with multi-layer PTFE coating
- Inlet/Outlet ports: large flange with 36 mm ID. Additional multiple ports on the side walls of the microwave cavity
- Chassis protected: against acids & solvents with polymer coating on both inner and outer surfaces
- Door: completely made of stainless steel, safety self-resealing pressure responsive door, automatic door locking system
- Safety features: four independent door safety interlocks to prevent microwave emission in case of improper door closure or misalignment
- Exhaust system: built-in, located on the back of the microwave cavity and separated from the electronics to prevent corrosion
- Video camera: built-in (safeVIEW)
- Coloured back light logo indicates the process status
- Magnetic stirring (optional): software-controlled in-vessel magnetic stirring of solution up to a speed of 3400 rpm
- Microwave emission: dual magnetron system with rotating diffuser for homogeneous microwave distribution in the cavity. Exclusive magnetron protection from reflected microwave power. Simultaneous microwave emission from both magnetrons
- Magnetron frequency: 2450 MHz
- Magnetron output: 2 x 950 Watt, continuous and PID-controlled microwave emission at all power levels
- Emission and safety norms: UL 61010-1:2012/R:2016-04, UL 61010-2-010:2015-01, CAN/CSA C22.2 No.61010-1:2012/U2:2016-04, CAN/CSA-C22.2 No.61010-2-010:2015-01
- Microwave cavity volume: 70,5 L
- Microwave cavity dimensions: 430 (w) x 400 (d) x 410 (h) mm

USER INTERFACE

- Control terminal touch-screen 6,5” TFT display, 640x480 VGA resolution with 262K colors, 5 USB ports, 1 RS232 port, 1 LAN port, 2 Video ports. Balance, Printer, mouse and keyboard connections
- Operating software: icon-driven multi-language software (Chinese, English, French, German, Italian, Japanese, Polish, Portuguese, Russian, Spanish, and Turkish), software with multilevel access allowing the user/administrator the edit, save and run a virtually unlimited number of methods
- Software features: built-in application library divided by application fields, including all digestion parameters (sample amount, reagents type and volume, time, power, temperature, pressure)
- Rotor diagram visualizes the temperature of individual vessels during the digestion process
- Additional features: PDF creator; sample table; 21 CFR part 11 compliant; auto-save of the runs; selectable exhaust speed

MILESTONE CONNECT

- Web based app for most devices (PC, tablets or smartphones) to control/monitor the unit
- Database with an extensive library of information (list of parts, technical notes, user manuals, video tutorials, updated application notes, a complete library of relevant scientific articles, and an online help section
- Wireless control of the system from any device using Milestone Connect on the same network

GENERAL INFORMATION

- Dimensions: 540 (w) x 640 (d) x 690 (h) mm
- Weight: 84 Kg
- Power supply: 230 V, 50-60 Hz

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REACTION SENSORS

- **easyTEMP**: contact-less direct temperature control in all vessels up to 300°C. Temperature conditions for each position is displayed into a rotor diagram and/or temperature profile
- **T1**: direct temperature monitor and control via shielded thermocouple or microwave-transparent fiber optic sensor up to 300°C in a reference vessel
- **P1**: direct pressure monitor and control up to 100 bar (ca.1500 psi) in a reference vessel
- **P2**: contact-less pressure monitor and control up to 100 bar (ca.1500 psi) in all vessels

PRESSURE VESSELS

- **MAXI-44**: high throughput rotor up to 44 PTFE-TFM-Teflon vessels, with a volume up to 100 mL. Maximum temperature 300°C, maximum pressure 35 bar (ca. 500 psi)
- **MAXI-24 HP**: high throughput and high performance rotor up to 24 positions with PTFE-TFM-Teflon vessels, with a volume of 80 mL. Maximum temperature 300°C, maximum pressure 60 bar (C.a 900 psi)
- **SK-15**: high pressure rotor up to 15 PTFE-TFM-Teflon vessels, with a volume up to 100 mL. Maximum temperature 300°C, maximum pressure 100 bar (ca. 1500 psi)
- **SK-10**: up to 10 TFM-Teflon vessels, with a volume up to 100mL. Maximum temperature 300°C, maximum pressure 100 bar (1500 psi)
- **SR-15**: up to 15 PTFE-TFM vessels, with a
- volume up to 100 mL. Maximum temperature
- 260°C, maximum pressure 35 bar (ca. 507 psi) with vent-and-reseal technology
- **MAXI-14**: up to 14 TFM-Teflon vessels, with a volume up to 100mL. Maximum temperature 300°C, maximum pressure 35 bar (500 psi). Upgradable to MAXI-44

- **Flexibility**: with the suitable selection of accessories, ETHOS can perform also microwave solvent extraction, microwave evaporation/ concentration and fusion/ ashing in a single platform

STANDARD METHOD COMPLIANCE

- **US EPA 3052**: Microwave-assisted acid digestion of siliceous and organically based matrices
- **US EPA 3051A**: Microwave-assisted acid digestion of sediments, sludge, soils, and oils
- **US EPA 3015A**: Microwave-assisted acid leach of aqueous samples and extracts
- **US EPA 3546**: Microwave extraction of semi-volatile organic compounds, organophosphorus and organochlorine pesticides, chlorinated and phenoxyacid herbicides, substituted phenols, PCBs, and PCDDs/ PCDFs, which may then be analyzed by a variety of chromatographic procedures
- **ASTM D4309-96**: Standard practice for sample digestion using closed-vessel microwave heating technique for the determination of total metals in water
- **ASTM D-5765**: Standard Practice for solvent extraction of total petroleum hydrocarbons from soils and sediments using closed vessel microwave heating
- **ASTM D-6010**: Standard practice for closed vessel microwave solvent extraction of organic compounds from solid matrices
- **RoHS**, **WEEE** and **ELV** Suitable for RoHS (Restriction of the use of certain Hazardous Substances in electrical and electronic equipment), WEEE (Waste Electrical and Electronic Equipment) and ELV (End-of-Life Vehicles) sample preparation
- **ICH Q3D**, **USP <232>**,**<233>**: to be implemented respectively Dec, 2017 and Jan, 2018. EMA and ICH Q3D applicable for authorized drug products in the EU and Implementation of USP new chapter <232>/<233>