

RAYPA

Leading
Lab Technologies



Food analysis

FAT EXTRACTION SYSTEM

SX-6 MP

RELIABLE, PRECISE AND
ECONOMIC SOLVENT EXTRACTION
SYSTEM FOR AN EFFICIENT FAT
EXTRACTION ANALYSIS



Fat extraction system

Our fat extraction system is specially optimized to determine crude fat or other components soluble in organic solvents according to the universally known **Solvent extraction method**, including both **Randall** and **Twisselmann** methods.

Its flexibility to analyze a wide variety of samples ranging from food to environmental soil analysis makes our extractor suitable for multiple settings and applications.

SX-6 MP is designed to guarantee accurate and precise results according to the international standardized methods such as **AOAC, ISO, AACC, DIN** and **EPA**.



MAIN FIELDS OF APPLICATION



FOOD AND FEED INDUSTRY

Milk and dairy products, Cereals, Meat and derivatives, Fish and seafood, Chocolate and cocoa products, Oil and oil seeds, Dry fruits.



PHARMACEUTICAL INDUSTRY

Material design, Herbal medicine products, polymers R&D.



ENVIRONMENTAL ANALYSIS

Sewage water, Mineral oils, Lubricants, Soils.



TEXTILE ANALYSIS

Impurities detection, Cotton, Coating materials.



CHEMICAL ANALYSIS

Pesticides, Fertilizers, Refined chemicals.



COSMETICS

Lipid-based formulations, Formulas R&D, Vitamins.



FEATURES

FAST EXTRACTIONS

SX-6 MP extractors are designed to follow the Randall method, a standardized method which is much faster than the traditional Soxhlet method.

VERSATILE

The equipment allows independent programming of temperature and extraction times, facilitating the analysis of a wide range of analytes according to the specific needs of each sample.

HIGHLY EFFICIENT

A powerful electric plate with armored resistance homogenously heats samples, allowing simultaneous analysis of six samples with identical conditions.

LOW RESOURCES CONSUMPTION

The cooling water regulation system reduces the amount of cooling water consumption, an external recirculating cooler can also be connected. Smaller extraction cups lower the required quantity of solvents for extraction.

QUALITY AND SAFETY GUARANTEE

Easy to clean and corrosion resistant external frame made of stainless steel grade AISI-304 with epoxy coating. A pressure switch protects the condensers from high pressure water. Different gaskets according to solvent used are also available.

BENEFITS



Compatible with different methods and a wide variety of samples.



According to standardized analysis procedures.



Minimal care required during extraction phases.



Constant supervision of flow rate.



Equipment components resistant to several organic solvents.



Different gaskets included to use with different solvents.



Alarms and indicators for full analysis control.



Solvent recovery for future reuse.

LIMITED SUPERVISION

SX-6 MP is a semiautomatic extractor, for each phase change the equipment makes an acoustic signal, warning the user that a change of samples position is required and thus the user does not need to continuously monitor the entire analysis.

SOLVENT RECOVERY FOR FUTURE REUSE

After the extraction process is complete, SX-6 MP allows the recovery of most of the solvent. This solvent can be reused in subsequent tests, significantly reducing the cost of the analysis.

TEMPERATURE CONTROL

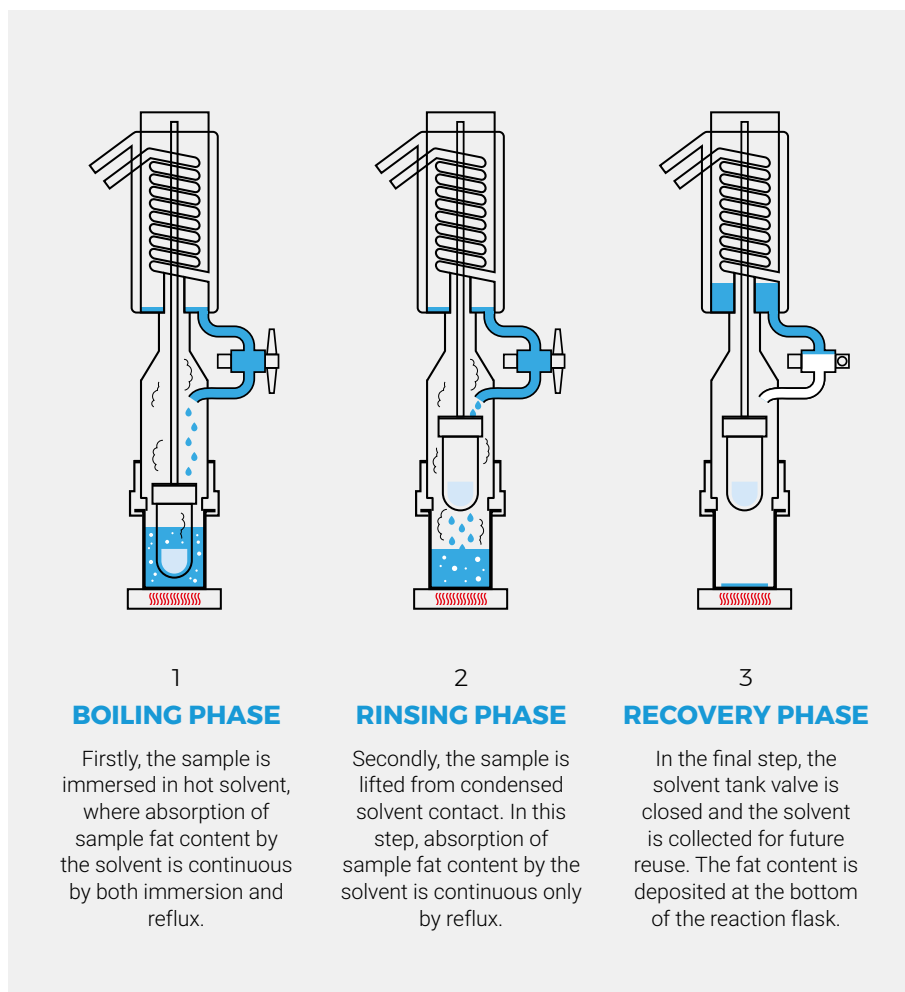
Control of temperature by PID microprocessor and a Pt100 class A temperature probe, overtemperature safety control by an independent thermocouple.

ACCORDING TO STANDARDIZED METHODS

Fat content analysis with SX-6 MP extractors are performed in accordance to official methods described by international entities such as AOAC, AACC, ISO, EPA and DIN in order to guarantee accurate results.

Fat extraction system

SX-6 MP'S WORKING PRINCIPLE ACCORDING TO THE RANDALL METHOD



The traditional **Soxhlet method**, invented by Franz von Soxhlet in 1879, is the most popular method for fat extraction. It is a standard procedure that provides good analyte recovery, however the extraction procedure is long (it can last 18-24h) and uses a significant amount of solvent.

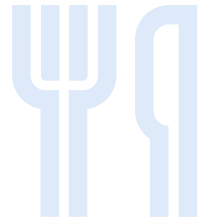
Soxhlet extraction consists in placing a previously dried sample inside a thimble made of cellulose and then it is loaded into the extractor, which is connected to a flask containing a solvent and a condenser. The solvent is heated and evaporated, the hot solvent vapor then

travels up to the condenser, where it cools and falls onto the sample in the thimble. The chamber containing the sample slowly fills with condensed solvent until, when almost full, it is emptied by a siphoning action back into the solvent flask. During each cycle, a portion of the soluble components in the solvent are extracted. This cycle is repeated several times until all analyte is separated from the sample.

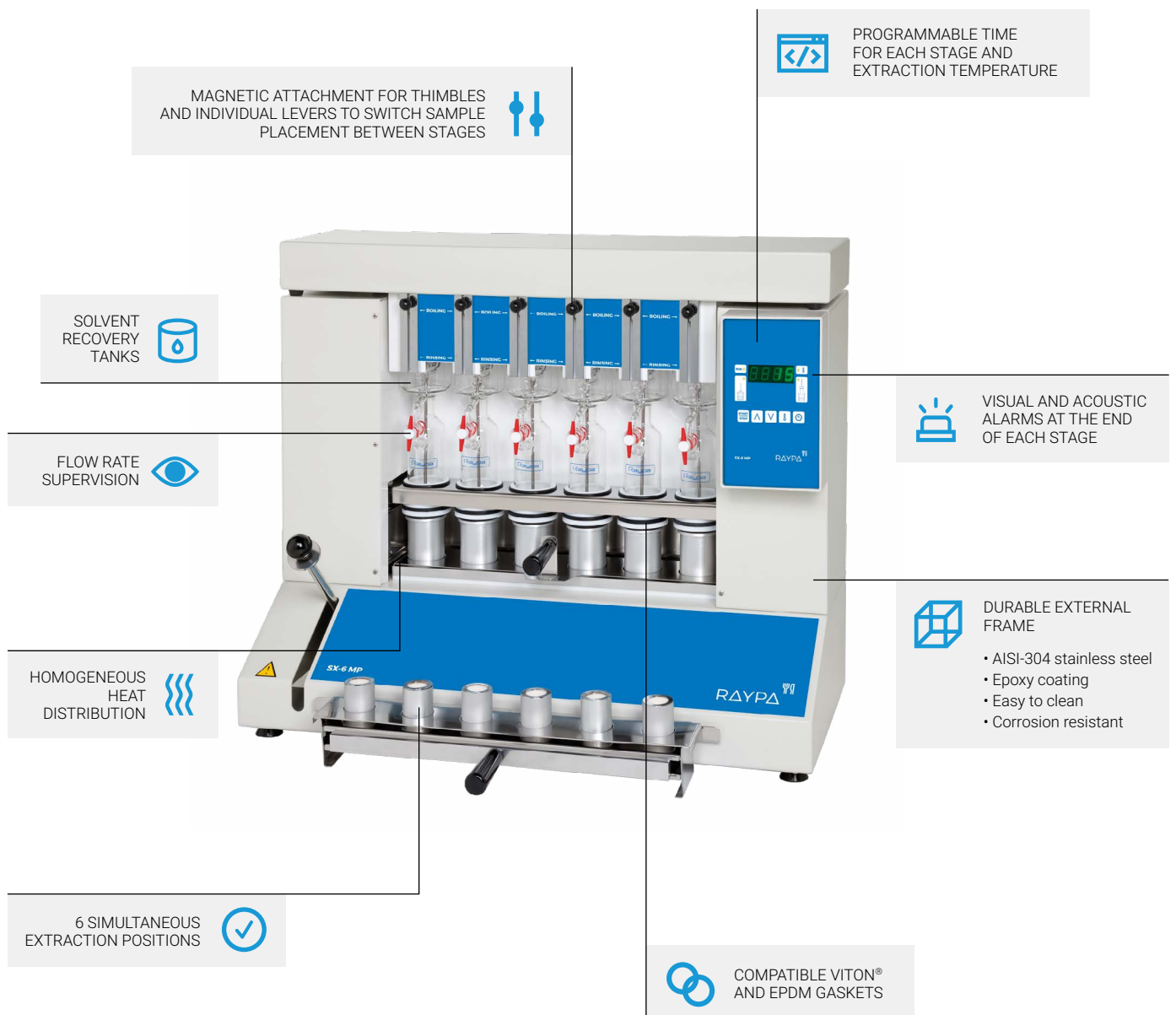
In order to improve effectiveness of Soxhlet extraction, alternative methods that use the same extraction principle but

have some improved features have been developed. **Randall method**, suggested by Edward Randall in 1974, is an example of this improvement as it typically allows the reaction to be **four times faster and guarantees solvent recovery**. SX-6 MP extractors can be programmed with different extraction steps according to Randall analysis as seen on this page figure.

Twisselmann extraction, also known as continuous economic extraction requires only one extraction position, between boiling and rinsing. The solvent placed in the extraction cup is heated and evaporated, these vapors pass through the sample and reach the condensation chamber, once liquefied, the solvent falls onto sample and is collected again in the extraction cup. Thus, both vapor and liquid forms of solvent simultaneously and continuously extract all lipid content from the sample. After all analyte has been collected, solvent can also be recovered.











MAIN FEATURES



Fat extraction system

TECHNICAL SUMMARY OF SX-6 MP

 General info	Extractor general classification	Semiautomatic
	Extraction positions	6
	Standards compliance	AOAC, AACC, DIN, EPA, ISO
	Dimensions L x D x H mm	680 x 330 x 580
	Weight Kg	46
	Power W	1500
	Voltage V	230 V (115 V optional)
	Frequency Hz	50/60
	Electric protection grade	IP 65
 Compatible standardized fat extraction methods based on Soxhlet	Fat extraction according to Randall	✓
	Fat extraction according to Twisselmann	✓
 Materials	Seals	Viton® & EPDM
	Extraction thimbles	Cellulose
	Condensers flasks	Borosilicate 3.3
	Extraction vessels	Aluminum
	Extraction column support	Teflon®
	Connection tubing	Silicone
	External housing	AISI-304 stainless steel painted with epoxy resin
 Display	Screen type	LED
	Displays values of	Temperature plus boiling, rinsing and recovery times
 Adjustable program parameters	Temperature of heating plate °C	Ambient temp. +5 - 220
	Boiling time hours:minutes	00:00 - 99:59
	Rinsing time hours:minutes	00:00 - 99:59
	Recovery time hours:minutes	00:00 - 99:59
 Performance	Extraction speed at 230V drops/sec	3 to 5
	Sample capacity/batch units	6
	Sample capacity/day units	36
	Cooling water consumption L/min	4
	Solvent recovery %	Up to 95
	Sample fat content measuring range %	0,1 - 100
	Temperature accuracy	± 0,5
	Reproducibility %	± 1
 Solvent and sample management	Solvent volume per slot ml	50
	Individual solvent recovery tanks	✓
	Compatible Viton® and EPDM gaskets	✓
 Alarms	Acoustic alarms	✓
	Visual alarms	✓
	End of rinsing phase alarm	✓
	End of boiling phase alarm	✓
	End of extraction phase alarm	✓

✓: Included



Complete batch handling items included

25 CELLULOSE EXTRACTION THIMBLES	✓
12 EXTRACTION THIMBLE SUPPORTS	✓
12 ALUMINUM EXTRACTION VESSELS	✓
6 MAGNETIC ADAPTERS	✓
6 EPDM GASKETS	✓
6 VITON® GASKETS	✓
2 RACKS FOR EXTRACTION THIMBLES	✓
2 RACKS FOR EXTRACTION VESSELS	✓
1 ALIGNING RACK FOR EXTRACTION VESSELS	✓
1 TONG FOR AN INDIVIDUAL MANIPULATION OF EXTRACTION VESSELS	✓
1 TONG FOR A SIMULTANEOUS MANIPULATION OF 6 EXTRACTION VESSELS	✓
2 SILICONE TUBES 1,5M (Ø 8 X 14)	✓



Accessories

EXTRACTION THIMBLES SET

Reference	CD-2526
Dimensions Ø x H mm	Ø 26 x 60
Material	Cellulose
Quantity units	25

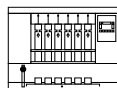


EXTRACTION VESSEL SET

Reference	CEX
Dimensions Ø x H mm	Ø 51 x 59
Material	Aluminum
Quantity units	6



THECHNICAL DATA



Dimensions and performance

Reference	SX-6 MP	
External dimensions L x D x H mm	680 x 330 x 580	
Power W	1500	
Voltage* V	230	
Weight Kg	46	
Reproducibility %	±1	
Solvent recovery %	Up to 95	
Temperature accuracy °C	± 0,5	
Sample capacity	Batch units	6
	Day units	36

*Also available with a voltage of 115 V.

Regulations

Our SX-6 MP fat extraction system is designed to comply with the strictest international directives and standards, including the following:

- **EN-61010-1** Safety requirements for electrical equipment for measurement, control and laboratory use. **Part 1:** General requirements.
- **EN-61010-2-010** Part 2-010 Particular requirements for laboratory equipment for the heating of materials.
- **EN-61326** Electrical equipment for measurement, control and laboratory use. EMC Requirements.
- **2014/35/UE** Low voltage.
- **2014/30/UE** Electromagnetic compatibility.

International standardized methods

SX-6 MP fat extractors are fabricated guaranteeing compliance with a variety of international standards such as AOAC, AACC, DIN, EPA and ISO.

Main fields of application



FOOD AND FEED INDUSTRY

PHARMACEUTICAL INDUSTRY

ENVIRONMENTAL ANALYSIS



TEXTILE ANALYSIS

CHEMICAL ANALYSIS

COSMETICS

Safety

- IP 65 electric protection grade.
- Temperature limiter.
- Pressure regulator to avoid overpressure.
- Error messages for maximum safety.
- Corrosion-resistant easy-to-clean external frame made of stainless steel.

Warning

It is recommended to use the equipment inside a fumes hood at all times.

+ info

YouTube

CLICK!
 ACCESS
 THE
 SX-6 MP
 VIDEO

Find out more about our **SX-6 MP** on our **Youtube Channel**

Installation guide available, please contact us.

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