FOSS

Soxtec™ 200 series
Solvent Extraction Solution

Labtec™ Line

Soxtec™ solvent extraction systems for safe, convenient and economical determination of soluble, or extractable, matter. Typically five times faster than classical Soxhlet equipment, Soxtec™ systems provide rapid analysis with absolutely no loss in precision or accuracy. Soxtec™ 200 series comprises 2 different solvent extraction systems (ST 255 and 243) and a unique, patented hydrolysis unit (SC 247 SoxCap™) for hydrolysis including filtration and washing.

Sample	Parameters
Food, Feed, Agriculture, Soil, Wastewater, Sludge, Textiles, Plastics, Petrochemicals, Pharmaceuticals, Paper and a wide range of other industrial products.	Crude Fat, Total Fat Extractable matter

FOSS Solvent extraction systems

For 30 years, FOSS has developed and supplied instruments with a mission: to always make routine analysis simpler.

A great step forward

As early as 1975, we revolutionised solvent extraction by introducing Edward Randall's patented two-stage technique for boiling and rinsing as RaFaTec – Randall Fat Tecator.
Six years later, FOSS launched an improved system, Soxtec™, based on Tecator™ technology, that also handled solvent recovery.

A profitable solution

Both ST 243 and ST 255 Soxtec™ extractors have a capacity of 6 positions. All Soxtec models fully utilise our batch handling concept to make sample processing as easy and safe as possible. Whatever your Soxhlet extraction need is, we can offer you the right solution.

Safety is important

Minimal manual handling assures safety in the process. When the sample has been loaded, the solvent is added in a closed, secure system. The solvent dispenser, automatic solvent recovery and built-in fume hood limit solvent vapour to a minimum, thus ensuring a safe working environment.

Safety has always been important to us, the only electrical part in the Extraction unit, the hot plate, is spark proof. The dual temperature sensors ensure that the set temperature is kept and that the ignition point is never reached for any solvent.

Operating convenience

Overall laboratory efficiency is further improved by the purpose-developed handling tools delivered with the Soxtec system. The tools for simple batch-wise sample handling save time, simplify usage and minimise risk of operator error. There is no longer any need for manual handling of thimbles or hot extraction cups.

	Soxhlet	**Soxtec™**
Extraction time	8 ~ 16 hrs	About 1.5 hrs
Safety	Poor	Built-in
Extraction condition	Repeated elution with cold solvent	Boiling and rinsing extraction
Solvent recovery function	Unavailable	Available

The differences between Soxhlet and Soxtec™ methods

Technology

Soxtec™ Systems

Solvent extraction systems for safe determination of soluble matter in food, feed, soil, polymers, textiles, paper pulp, and more. Whatever your Soxhlet extraction needs, we can offer the right solution.

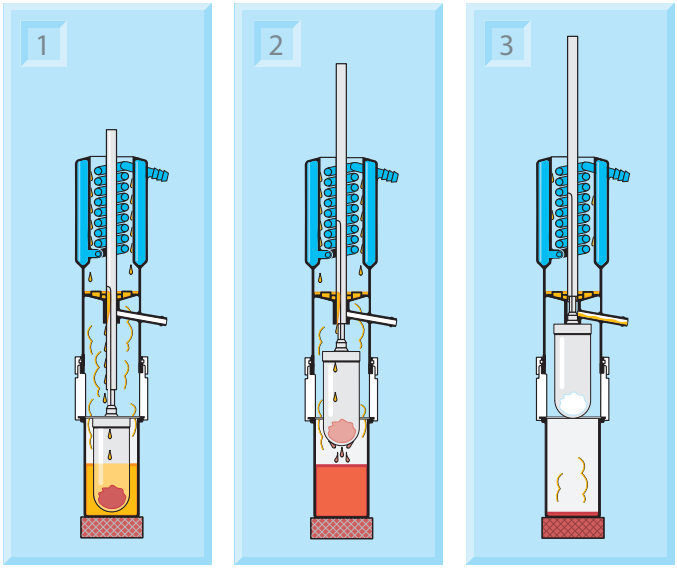
	ST 243 Soxtec™	ST 255 Soxtec™	SC 247 SoxCap™
Sample positions	6	6	6
Capacity, samples per day	36	36	36
Solvent volume per sample	40 – 50 ml	70 – 90 ml	–
Solvent recovery	80%	80%	–
Closed solvent addition	No	Yes	–
Programmable	Yes	Yes	No
Fully automated	No	No	No
Overnight operation	No	No	No
Batch handling	Yes	Yes	Yes
Extraction cups	Glass & Aluminium	Glass & Aluminium	–
Thimbles	Cellulose, Glass	Cellulose, Glass	Cellulose
Thimble diameter	26	26, 33	30
Thimble volume	30 ml	30 ml, 65 ml depending on thimble size	50 ml
Heating	Remotely controlled electric	Remotely controlled electric	Electric
Temperature range	0 - 285°C	0 - 285°C	–
Overtemperature protection	145, 210 & 330°C	145, 210 & 330°C	–
Power consumption	1500 W	1550 W	500 W
Water consumption	2 l/min	2 l/min	0.4 l/min
Water saving system	No	No	No
Dimensions, cm	51×32×58	60×38×58	19×30×11
Accuracy	± 1% relative	± 1% relative	± 1% relative

New generation of manual Soxhlet extraction system

The Soxtec systems performs boiling, rinsing and recovery. It is designed for maximum user convenience through batch handling of six samples at a time, giving a minimum of system handling. The systems consist of Extraction Unit and a control unit. The sample to be analyzed is weighed into thimbles and inserted in the Extraction Unit. The solvent is added in a closed system (ST 255). The cups are heated by the electrical heating plate. The 3-step extraction procedure consists of boiling, rinsing and recovery.

Application flexibility

Soxtec™ systems are developed for maximum application flexibility. Users can easily design and optimise their own applications for accurate, safe determination of soluble matter within the food, feed, environmental and industrial sectors. Soxtec™ can handle larger sample volumes (a standard 33×80 mm thimble), and its higher temperature range even enables effective use of high-boiling point solvents, such as Toluene and Xylene. Furthermore, the Glass/Teflon solvent interface makes it possible to run metal-sensitive applications.



Three automatic steps

1 **Boiling**
Rapid solubilisation in boiling solvent.

2 **Rinsing**
Efficient removal of remaining soluble matter.

3 **Recovery**
Automatic collection of distilled solvent for re-use.

The fastest on the market

Typically five times faster than the classical Soxhlet technique, in Food and Feed Applications, Soxtec™ Systems are the fastest Soxhlet extractors on the market.
The Soxtec™ systems follow officially approved methods for example fat in feed (AOAC, ISO), cereals (ISO) meat (AOAC), PCB (EPA) and paper pulp (SCAN).

Total fat analysis

In food, cereals and feed, fat often occurs in the form of phospholipids, and glycolipids or lipoproteins. These bound forms of fat are not recovered by standard solvent extraction procedures, and must first be released by means of acid hydrolysis. The SC 247 SoxCap™ is an integral part of the Soxtec™ systems. It offers total fat analysis in agreement with recognised methods. The SoxCap™ system performs hydrolysis, filtration and washing without any sample transfer. This patented technique offers high throughput together with minimum manual handling using batch handling tools. It is the only Hydrolysis system which has been validated in parallel with a collaborative study.

Accuracy

The accuracy of the SoxCap™ method has been verified by comparison with the revised prEN ISO/DIS 7302 method, as the same samples were used and the analyses were performed at the same time. prEN ISO/DIS 7302 became ISO11085 on publication.

Save time and money

Most users prefer aluminium extraction cups – only environmental applications require glass cups. Aluminium cups are unbreakable, and they offer rapid heat transfer, which in turn shortens heating and drying times.
Soxtec™ systems use environmentally sound technology. Compared to classical Soxhlet, these systems use a significantly lower solvent volume. No other Soxhlet extractor on the market uses solvents so efficiently. Thanks to solvent recovery, 16 ml of solvent is typically used per sample keeping costs for solvent purchase and disposal to a minimum (ST 255). Built-in water control minimises water consumption.

**Subject to local regulation*

Dramatically reduced extraction times Analyte	**Soxhlet** Extraction time	**Soxtec™** Extraction time
Fat in feed	2 h to 16 h	1 h
Fat in food (eg. meat, cereals)	2 h to 16 h	1 h
PCB, PAH & Pesticides in soil	17 h	2 h
Oil & Grease in water	4 h	45 min
Extractable Matter in polymers & rubber	2 h to 48 h	1 h to 5 h
Extractable Matter in paper & pulp	2 h to 48 h	1 h to 5 h
Hydrocarbons in petroleum rock	24 h	2 h
Finishing Oil on textile & synthetic fibres	2 h	30 min
Anti-caking coating on fertilisers	3 h to 4 h	1 h
Detergent in detergent powder	5 h	1 h
Fat in leather	5 h	1 h

Ordering information

ST 243 Soxtec™:

- ST 243 Soxtec™, 230 V complete with:
- 1 ea ST 243 Soxtec™ Extraction Unit
- 1 ea CU 2046 Control Unit
- 1 ea Food/Agri routine accessories kit comprising:
- Extraction cups (1 set of 6), Cup holder, Thimbles (set of 25), Thimble adaptors (1 set of 6), Thimble stand, Seals in Viton and Butyl, Manual and Application Note.

Consumables & Accessories for ST 243 Soxtec™:

- Cellulose thimbles, 26mm (set of 25)
- Thimble handler
- Thimble support
- Thimble support holder
- Cup holder
- Thimble stand, Metal
- Extraction cups (set of 6), Aluminium
- Extraction cups (set of 6), Glass
- Seals for condensers, Viton (set of 6)
- Seals for condensers, Butyl (set of 6)
- Seals for condensers, Teflon (set of 6)
- Seals for condensers, Polyurethane (set of 6)

For total fat determination, used in conjunction with Soxtec™ Extraction Systems we recommend:

ST 255 Soxtec™:

- ST 255 Soxtec™, 230V Complete with
- 1 ea ST 255 Soxtec™ Extraction Unit
- 1 ea CU 2055 Control Unit
- 1 ea Food/Agri routine accessories kit comprising:
- Extraction cups (3 sets of 6), Cup holder, Thimble support, Thimble holder, Thimbles (set of 25), Thimble adaptors (2 sets of 6), Thimble handler, Tongs for extraction cups, Thimble stand (2), Cup stand, Seals in Viton and Butyl, Solvent addition tube, Solvent emptying tube, Manual and Application Note.

Consumables and Accessories for ST 255 Soxtec™

- Cellulose thimble, 33mm (set of 25) double thickness
- Cellulose thimble, 33mm (set of 25) single thickness
- Extraction Cups (set of 6), Aluminium
- Extraction Cups (set of 6), Glass
- Seals for condensers, Viton (set of 6)
- Seals for condensers, Butyl (set of 6)
- Seals for condensers, RESEL (set of 6)
- Seals for condensers, Polyurethane (set of 6)
- Solvent dispenser

SC 247 SoxCap™

Compatible with Soxtec™ models 255, 245

SC 247 SoxCap™, 230 V, 50-60 Hz complete with: Ceramic Hot Plate 2022, Condenser holder with valve plate, Condenser, Hydrolysis Beaker, Beaker, Boiling Stand, Capsule Tray (set of 2), Drying Stand, Glass Capsules (2 sets of 6), Filters (set of 100), Thimbles (set of 25), Adapters (set of 6), Cotton, Water Aspirator, User Manual

Consumables & Accessories for SC 247 SoxCap™

- Filters, set of 100
- Cellulose Thimbles 28 × 22 mm, set of 25
- Hydrolysis Beaker
- Beaker, Low
- Condenser
- Condenser with drip tray assembly
- Boiling Stand
- Drying Stand
- Capsule Tray
- Adapters, set of 6
- Glass Capsules, set of 6 for SC 247 SoxCap™
- Glass Capsules mini, set of 6 for SC 247 SoxCap™ to use in combination with ST 243 Soxtec
- Cotton, defatted

Installation requirements

ST 243 Soxtec™						
Equipment	**Power supply**	**Power consumption**	**Dimensions w × d × h cm**	**Weight**	**Water supply**	**Ventilation**
Extraction Unit	-	-	57 × 35 × 58	30 kg	2 l/min	Fume hood min. airflow 0,5 m/s (inter locked)
Control Unit	230 V, 50-60 Hz	1250 W	28 × 23 × 19	3 kg	-	-

ST 255 Soxtec™						
Equipment	**Power supply**	**Power consumption**	**Dimensions w × d × h cm**	**Weight**	**Water supply**	**Ventilation**
Extraction Unit	-	-	60 × 38 × 58	30 kg	2 l/min	Fume hood min. airflow 0,5 m/s (inter locked)
Control Unit	230 V, 50-60 Hz	1 550 W	31 × 24 × 16	3 kg	-	-

SC 247 SoxCap™					
Equipment	**Power supply**	**Power consumption**	**Dimensions w × d × h cm**	**Weight**	**Water supply**
2022 Hot Plate	230 V, 50-60 Hz	500 W	19 × 30 × 11	2,5 kg	2 taps needed: 0,4 l/min Tap water for vacuum pump

Performance data

	ST 243 Soxtec™	ST 255 Soxtec™
Thimble size	26 × 60 mm Approx. 25ml	
Solvent volume	40 ml.	70-90 ml.
Extraction time	Typically 40 to 60 min, depending on application	
Capacity/batch	6 samples	6 samples
Capacity/day	30-36 samples	30-36 samples
Measuring range	0.1-100% fat	
Accuracy	According to official approvals	
Repeatability	± 1% rel. or better at 5-100% fat	
Heating up time	from 20°C to 285°C in 7-9 min (230 V)	from 20°C to 285°C in 7-9 min (230 V)

	SC 247 SoxCap™
Sample size	0.5 - 3 g
Hydrolysis time	60 min.
Measuring range	0.1 - 100 % fat
Capacity/batch	6 samples
Capacity/day	Up to 30 analyses

FOSS

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