

# FAT EXTRACTION



## RANDALL HOT SOLVENT EXTRACTION

Solvent extraction is used to determine the quantity of various components (e.g. Fat) contained in agricultural, industrial or environmental samples.

Soxhlet extraction, is one of the most widely used analytical technique which performs extraction with cold solvent. Adaptation of Soxhlet have been introduced over time, reducing extraction time by increasing the temperature of the solvent as with the Randall technique.

The solvent extractors of VELP Scientifica operate a solid-liquid extraction process that removes soluble components from solid samples using a liquid solvent according to the Randall technique, offering significant benefits in term of time saving and solvent recovery.

This method is performed in 3 main steps: Immersion, Washing and Recovery although other two intermediate steps, Removing and Cooling, can be added (with the SER 158) in order to maximize the performance.

Hot solvent extraction works in accordance with national and international standards and can be used in various industries and analytical fields.

## THE SER SERIES

The fully automatic SER 158 and the semi-automatic SER 148 guarantee safe operations and low solvent consumption for all sort of hot solvent extractions. The VELP extractors come with 3 or 6 positions.

The automatic and semi-automatic SER are fully equipped, versatile and with a complete range of accessories providing total flexibility in all fields of application.

Solvent extraction with the SER series can be performed not only for Fat extraction (crude and total) in food and non-food samples but also for sample preparation for additional test such as Hydrocarbons from soil, Oil in sludge, Paraffin in wood chips, and many more.

APPLICATIONS:	MAIN INDUSTRIES:
FAT DETERMINATION (CRUDE AND TOTAL)	FOOD AND FEED
OIL/FAT CONTENT DETERMINATION	ENVIRONMENTAL, TEXTILE, PULP & PAPER
SAMPLE PREPARATION FOR THE EXTRACTION OF POLLUTANTS AND CONTAMINATED ELEMENTS	PLASTIC & PETROLEUM, ENVIRONMENTAL



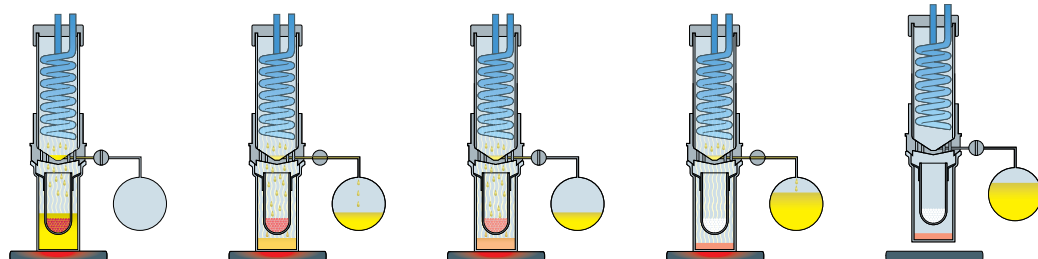
**GLP** Good Laboratory Practice  
AOAC • ISO • EPA • APHA • UNI

### SOXHLET TECHNIQUE



The solubilization of extractable components is performed by a cold solvent dropping from a reflux condenser. Consequently a complete extraction lasts many hours.

### SER 158 FULLY AUTOMATIC EXTRACTION PROCESS



#### IMMERSION

The sample is immersed into boiling solvent

#### REMOVING\*

Solvent volume is reduced

#### WASHING

The solvent flows through the thimble

#### RECOVERY

Solvent is recovered

#### COOLING\*

Prevention of extracted matter overheating

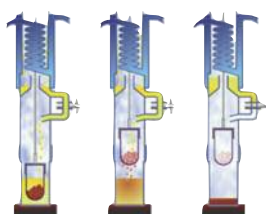
\*Performed only with the SER 158.

# SER 148 SOLVENT EXTRACTOR

The **SER 148/3** and **SER 148/6** can be used to separate a substance or a group of elements (e.g. fat) from solid and semi-solid samples according to the **Randall technique** (consisting of Immersion, Washing and solvent Recovery).

The SER 148 Series is a semi-automatic solution with no compromises on **operator safety (IP55)** and **solvent consumption** also guaranteeing a **limited cost per analysis**.

Robust design and large install base make the SER 148 Series the reliable choice for any laboratory aiming at reducing the time per analysis compared to the traditional Soxhlet method. As for the automatic version, the main field of application is the determination of the content of soluble products such as fats, detergents, plasticizers and pesticides in food, animal feeds, detergents, rubber and plastic formulas, pharmaceutical products, soil.



## RANDALL TECHNIQUE

The first phase of extraction is performed by immersing a sample - containing thimble in boiling solvent followed by a washing with cold refluxing solvent. The fast solubilization achieved by the hot solvent results in a sharp reduction of extraction time.

## CONSUMABLES

## CODE No

Extraction thimbles 33x80 mm, 25 pcs/box **A00000295**



## SUPPLIED WITH

## CODE No

Extraction Cups SER 148/3	<b>A00001141</b>
Extraction Cups SER 148/6	<b>A00000142</b>
Extraction Thimbles 33X80, 25pcs/box	<b>A00000295</b>
Inlet Tube	<b>10000280</b>
Heat Shield SER 148/3	<b>40000210</b>
Heat Shield SER 148/6	<b>40000220</b>
Viton seal SER 148 3pcs/box	<b>A00000307</b>
Butyl seal SER 148 3pcs/box	<b>A00000308</b>

## OPTIONAL ACCESSORIES

## CODE No

Printer	<b>A00001009</b>
Serial cable	<b>A00000011</b>
Thimble weighing cup SER158-14	<b>A00000310</b>
Vafion seal SER 148 3pcs/box	<b>A00000061</b>
IQ/OQ SER 148 Manual	<b>A00000073</b>
Handling device for extraction cup (for SER 148/6)	<b>A00001145</b>
Pincer for weighing cups (for SER 148/6)	<b>A00001147</b>
Thimbles stand (6 places)	<b>A00001149</b>
Extraction thimbles holder	<b>A00001142</b>
Crucible holder HU6 for SER148	<b>A00000309</b>
Glass fiber thimbles 33x80, 25pcs/box	<b>A00000313</b>
Oat meal, 30g	<b>A00000318</b>

## INSTRUMENT

## POWER SUPPLY

## CODE No

SER 148/3	230 V / 50-60 Hz	F30300240
SER 148/3	115 V / 50-60 Hz	F30310240
SER 148/6	230 V / 50-60 Hz	F30300242
SER 148/6	115 V / 50-60 Hz	F30310242

## SER 148/6



## SER 148/3



## GENERAL FEATURES AND PERFORMANCE

CONSTRUCTION MATERIAL	Epoxy painted stainless steel structure
MAX VOLUME EXTRACTION CUP	150 ml
DISPLAY	Working temperature / settable parameters
WORKING TEMPERATURE	From 100 to 260 °C
IMMERSION, WASHING & RECOVERY TIME	From 0 to 999 minutes
SAMPLE QUANTITY	From 0.5 to 15 g (generally 2-3 g)
SOLVENT RECOVERY	From 50 to 75%
REPRODUCIBILITY (RSD)	≤ 1%
INTERFACE	RS232
POWER	500 W (SER 148/3) or 950 W (SER 148/6)
DIMENSIONS (WxHxD)	480x620x390 mm (18.9x24.4x15.4 in) (SER 148/3) 700x620x390 mm (27.6x24.4x15.4 in) (SER 148/6)
WEIGHT	30 Kg (66 lb) (SER 148/3) 40 Kg (88 lb) (SER 148/6)

# HU 6 HYDROLYSIS UNIT

The **HU 6** offers the optimum solution for the acid hydrolysis of food and feed samples prior to solvent extraction for total fat analysis.

Very often the samples to be analyzed have a high fat content and need to be prepared for fat extraction.

The HU 6 is a 6-position hydrolysis unit that combines **safety** with **performance, reducing manual handling** to the minimum.

Hydrolysis is carried out with hydrochloric acid for approximately one hour at a temperature of 170 °C. The hydrolyzed sample is then filtered in a glass crucible and washed with warm de-ionized water in order to eliminate the residues of hydrochloric acid.

The sample is now ready to be processed using the SER 148.

The HU 6 is suitable for both acid and basic hydrolysis.

INSTRUMENT	POWER SUPPLY	CODE No
HU 6	230 V / 50-60 Hz	F30300110
HU 6	115 V / 50-60 Hz	F30310110



## GENERAL FEATURES AND PERFORMANCE

CONSTRUCTION MATERIAL	Epoxy painted stainless steel structure
NUMBER OF SAMPLES	6 samples
SET TEMPERATURE AND COUNTDOWN	Digital readout
DISPLAY	LCD
PROGRAM LIBRARY	20 programs
LANGUAGES	I, F, UK, E, D, T
TEMPERATURE RANGE	Ambient to 200 °C
TEMPERATURE PRECISION, STABILITY AND HOMOGENEITY	± 0.5 °C
POWER	1350 W
DIMENSIONS (WxHxD)	355x590x450 mm (14.0x23.2x17.7 in)
WEIGHT	14.5 Kg (32.0 lb)

## SUPPLIED WITH

	CODE No
Celite, 1 Kg	A00000097
Glass sand, 2 Kg	A00000089
EDPM tube Ø 6.4x11.2 mm	10002412

## OPERATING ACCESSORIES

	CODE No
Glassware kit 3 positions for HU 6	A00000085
Crucible holder HU 6 for SER158	A00000293
Crucible holder HU 6 for SER148	A00000309

## OPTIONAL ACCESSORIES

	CODE No
Glass crucibles P1, 6 pcs/box	A00000086
Glass crucibles P3, 6 pcs/box	A00000087
Glass bottle for waste collection	A00000088
Test tubes Ø 42x300 mm, 250 ml, 3 pcs/box	A00000144
IQ/OQ Manual	A00000251