

## Mill Collection

CT 193 Cyclotec™, CM 190 Cemotec™, KN 195 Knifetec™, HM 294 Homogeniser and HM 297 Homogeniser



### Labtec™ Line

The Mill Collection covers a broad range of sample preparation applications for both traditional wet chemistry and instrumental analysis. The range includes HM 294 Homogeniser and HM 297 Homogeniser for rapid homogenization of larger samples with a high fat or oil content; the CM 190 Cemotec™ for grinding solid samples without moisture loss; the CT 193 Cyclotec™ for uniform grinding of dry samples and the KN 195 Knifetec™ for the preparation of high-fat, high-moisture and fibrous samples.

#### Sample

- Raw materials and finished products in Food, Feed and Agriculture
- Also used in a wide range of industrial applications



## Sample preparation for good results

Good results start with sample preparation. Errors caused by analytical instruments are very small compared to the errors associated with sample preparation. Badly prepared samples will automatically result in large analytical errors.

The laboratory sample mill is an important but often overlooked link in the chain of analysis; so important that FOSS regards it as an integral part of the analytical system.

## A broad range of applications

To assure the best analytical results FOSS has developed a range of specially designed mills that are both safe and convenient safe to use. The Mill Collection covers a broad range of grinding applications, including preparation for both traditional wet chemistry and NIR/NIT analysis.

## Ensuring reliable analysis

The Mill collection consists of high quality products that ensure reliability and reproducibility of the analysis. CM 190 Cemotec™, CT 193 Cyclotec™, KN 195 Knifetec™ and the HM 294/297 Homogenisers offer low maintenance, effective sample preparation and easy-to-clean or self cleaning actions that minimise cross contamination, for easy use in the laboratory.

### **CT 193 Cyclotec™:**

General purpose sample mill

- Dry samples prior to wet chemistry or IR analysis.
- Low fat/low moisture samples (up to 15% Moisture and 10% Fat)

### **CM 190 Cemotec™:**

Coarsely grinds grain without moisture loss

- Dry sample prior to moisture analysis
- Low fat/low moisture samples (up to 15% Moisture and 10% Fat)

### **KN 195 Knifetec™:**

For high fat, high moisture and fibrous sample.

- Up to 100ml sample (50-150g)

### **HM 294 Homogeniser and HM 297 Homogeniser:**

For high fat, high moisture and fibrous samples

- 2094 0.1 – 1.5 kg sample capacity (1.5 litre max)
- 2097 0.1 - 2.5 kg sample capacity (2.5 litre max)

# Technology

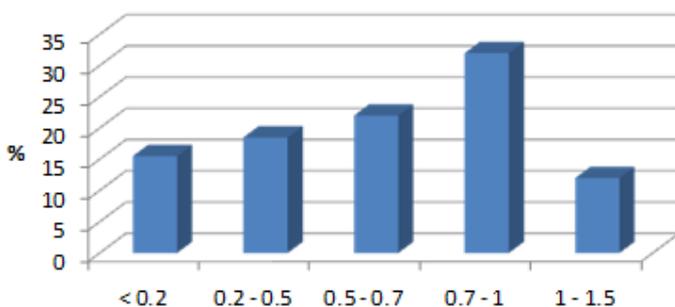


CM 190 Cemotec™

## CM 190 Cemotec™

### Sample grinding without moisture loss.

The CM 190 Cemotec™ is specially designed to grind grain and seed samples without losing moisture content. It is an excellent mill for all types of sample preparation where the requirements for fineness and uniformity of particle size are moderate.



Typical CM 190 Cemotec™ particles size distribution

CM 190 Cemotec™ can be used for dry and low fat samples, up to 15 % Moisture and 10 % Fat.

### Description:

The CM 190 Cemotec™ works on the principle of shearing between two discs, one stationary and one turning. The sample is introduced at the centre of the stationary disc and is crushed between the discs.

The distance between the discs is easily adjusted by a graduated knob to control the fineness of the grist.

### Accessories

- Sample bottles with lids – 100 or 500 pack sizes
- Grinding discs – 1 pair



CM 190 Cemotec™ accessories

### Benefits:

- No loss of moisture
- Reliable classic working principle
- Low noise level
- Low maintenance demand



CM 190 Cemotec™ working principle

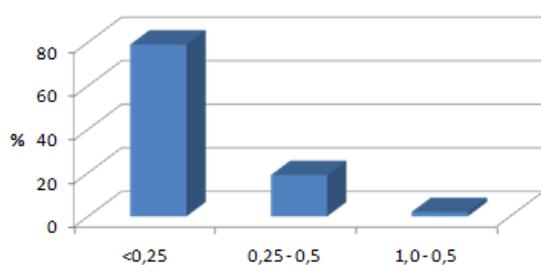


CT 193 Cyclotec™ with standard sample inlet and 125 ml bottle

## CT 193 Cyclotec™

### Rapid sample preparation for general laboratory analysis

The CT 193 Cyclotec™ offers a very rapid and convenient sample preparation in a variety of analytical techniques such as Kjeldahl, infrared reflectance, direct distillation, crude fibre and extraction. It is an excellent mill for all types of sample preparation where the requirements for fineness and uniformity of particle size are high.



Typical particle size distribution with a 1 mm mesh screen

CT 193 Cyclotec™ can be used for dry and low fat samples, up to 15 % moisture and 10 % fat – such as a wide variety of feeds, grains, leaves, etc. and also for grinding of chemicals, pharmaceuticals and similar products.

### Description:

The CT 193 Cyclotec™ grinds samples by a high speed action, rolling the sample against the inner circumference of a durable grinding surface and then passes it through a fine mesh screen. The high volume air flow provides self cleaning, action, ena-

bling whole series of samples to be ground with minimal cross contamination.

### Accessories:

- Large sample inlet for easier loading of larger sample volumes or bulky samples such as forage
- Large sample bottle holder, for 500 ml bottles
- Range of screens: 0.3 mm, 0.5 mm, 0.8 mm, 1 mm (included) and 2 mm
- Bottles with lids, 125 ml and 500 ml
- Dust collection options
  - Dust filter pad (included)
  - Paper bags for dust collection
  - Dust collection with external connection
- Grinding rings
  - Tungsten Carbide – for grain and feed
  - Hard sample ring – for added durability
  - Steel grinding strip, self-adhesive, set of 3
- Impellers
  - The standard impeller in aluminium
  - Nickel plated – for added durability

### Benefits:

- High grinding speed, 4 grams per second
- No thermal degradation of the sample
- Uniform particle size distribution
- Low maintenance demand
- Approved by AOAC prior to NIR analysis (4.2.10 17th Ed.)



## KN 195 Knifetec™

### Rapid sample preparation of high-fat, high-moisture and fibrous samples

The KN 195 Knifetec™ is designed for the preparation of high fat, high moisture and fibrous samples prior to analysis, such as oilseeds, prepared foods, meat products, fruit, vegetables, grains, seeds and feed .

### Description:

The high speed rotor blade and timer control ensure very fast and reproducible sample preparation time after time. The normal time to prepare samples is from two to ten seconds. A safety switch located in the lid prevents accidental operation of the mill with the lid removed.

The KN 195 Knifetec™ is equipped with a grinding chamber cooling feature which enables it to be connected to a cold water tap or other laboratory chilling devices.

Samples containing high levels of fat have a tendency to stick to the wall of the chamber as the fat softens during grinding, preventing adequate homogenisation.

Fibrous samples may generate heat due to friction.

Utilizing the cooling option overcomes both these problems, ensuring satisfactory sample preparation.

The fully removable lid, the stainless steel chamber and the removable rotor blade of the KN 195 Knifetec™ simplify sample removal and cleaning between samples.

An integral tilting system simplifies emptying and cleaning.

### Benefits:

- Timer controlled
- Integral tilting system, fully removable lid and rotor blade to facilitate cleaning
- Chamber cooling option reduces adhesion of sample to the wall of the grinder

### Accessories

- **Rotor Blade - Standard:** The vast majority of applications work perfectly with this standard unsharpened rotor. Where we have experienced a particular issue with a certain type of sample, we have introduced alternative solutions as listed and described in the following paragraphs.
- **Rotor Blade - Sharp:** Improves performance in some applications, such as the reduction of small meat samples, or some types of fruit and vegetables, such as unpeeled apples, pears, carrots etc., where the skin is often not reduced with the unsharpened standard rotor.
- **Rotor blade for small sample volumes**  
The blades are situated lower in the bowl than the standard rotor blade. In addition it has sharp edges.
- **Rotor blade for pellets**  
The blades are situated on different levels, one lower and one higher, which helps to prevent pellets lodging under the rotor. In addition it has sharp edges.
- **Lid with funnel for pellets**  
This lid with a mounted funnel feed, enables the user to safely add 'kibbles' (pet food pellets) with the lid in place and the motor running. This prevents 'tripping' of the safety cut out caused by overloading the grinding chamber in normal use.
- **Stainless steel sample tray**  
A stainless steel sample collection tray, makes transfer of ground sample to sample storage bottle quick and easy using the integral rocking/tilting cradle of the KN 195 Knifetec™.



## HM 294 Homogeniser and HM 297 Homogeniser

### Rapid maceration and homogenization of a variety of samples.

The HM 294 and HM 297 Homogenisers are designed for macerating and homogenising of a variety of high moisture, high-fat and fibrous samples.

Application examples include:

- Size reduction of forage and dry food and chemical products
- Homogenisation of meat, fish, fruit, vegetables, prepared foods (such as pizza, meat pies and frozen meals) and chemical and pharmaceutical formulations.
- The Homogenisers allow frozen food samples to be homogenised in a short period of time, providing more accurate analyses of unstable constituents such as vitamins.

### Description:

A reproducible degree of homogenisation is achieved by the mixing action obtained by the angled knives.

Homogenisation is accomplished through the high speed combined with a powerful cutting action.

Angled knife blades produce a vertical flow within the batch and facilitate rapid and thorough homogenization.

Complete homogenisation is normally achieved in 20 to 60 seconds.

A magnetic safety switch prevents the HM 294 and HM 297 Homogenisers from being operated without the transparent cover in the locked position.

The HM 294 and HM 297 Homogenisers comes with a multi purpose micro-teeth cutter. For additional convenience extra stainless steel bowls and smooth blade cutters are available for both Homogenisers.

### Accessories

- Cutters, available as micro-teeth blade (included) and smooth blade
- Extra bowls

### HM 297 Features and benefits

- Powerful 2 speed (3000/1500 rpm ) 400V 50Hz three phase motor
- Variable speed (up to 1500 rpm) 115V/60 Hz single phase model available
- 5.5 litre stainless steel bowl
- 0.1 - 2.5 kg sample capacity (2.5 litre max)
- Pulse mode for frozen food applications
- Multi-purpose stainless steel micro teeth blades as standard. Smooth blades optional.
- Safety switch protects user
- Easy to clean



Smooth (left) and microteeth (right) cutterblades

### HM 294 Features and benefits

- Powerful 1500 rpm single phase motor
- 230V/50Hz and 115V/60Hz models available
- 3.5 litre stainless steel bowl
- 0.1 – 1.5 kg sample capacity (1.5 litre max)
- Pulse mode for frozen food applications
- Multi-purpose stainless steel micro teeth blades as standard. Smooth blades optional
- Safety switch protects user
- Easy to clean



## Secure your investment with a FossCare™ Support Agreement

Let FOSS take care of you for a maximum return on your analytical investment. Get a four year warranty as part of the new FossCare Premium Preventive Maintenance Agreement or two years as part of any other FossCare agreement. In addition to the peace of mind afforded by the warranty period, the continual preventive maintenance pays off by keeping your analytical instruments working perfectly every day, year after year.

### Why preventive maintenance?

As with any analytical solution, it is essential that your FOSS instrument receives regular maintenance to ensure optimal performance and extended lifetime. Avoiding expensive downtime is a matter of following factory standards and preventively replacing parts before they wear out. In turn, this helps ensure reliable and consistent results at the highest level.

Preventive and predictive maintenance combined with global support from 300 dedicated service, application, software and calibration specialists keeps your instrument running perfectly all year round.



### Benefits of a FossCare™ Support Agreement:

- Extended Warranty (two or four years depending on the chosen agreement)
- Regular maintenance; the instrument is diagnosed, cleaned, adjusted, tested, fine tuned and recalibrated
- Minimal downtime from replacing components before they are worn out
- Consistent, accurate and reliable results you can always trust
- Preventative maintenance visits when it suits you (your business)
- 24/7 phone support - no need to worry about closing hours or PO
- Low, fixed service budget prevents unexpected expenses
- Discounts on additional services, spares, training, reagents, consumables and software upgrades

Contact your local Foss office for more information.

# Technical Specifications

## Performance data



Feature	CM 190 Cemotec™	CT 193 Cyclotec™	KN 195 Knifetec™	Homogenisers
<b>Sample Type</b>	<p>Dry samples prior to moisture analysis, up to 15% Moisture and 10% Fat, such as:</p> <p>Grains, Cereals Seeds Beans Dry granular foods Pelleted feed Fertilizer</p>	<p>Dry samples prior to wet chemistry or IR analysis, up to 15% Moisture and 10% Fat, such as:</p> <p>Grains, Cereals Seeds Petfood pellets Hay, straw (dried and cut to 2-3cm) Silage (dried and cut to 2-3 cm) Pelleted feed Leaves Lime, Coal, Tobacco</p>	<p>High-moisture, high-fat and fibrous samples, such as:</p> <p>Grains, Cereals Beans Oilseeds Nuts Peas - wet and dry Maize (Corn) - wet and dry Pelleted feed and Pet food (3-4 mm) Pellets up to 6 mm - with lid for pellets Meat products Vegetables and Fruit</p>	<p>High-moisture, high-fat and fibrous samples, such as:</p> <p>Meat and meat products Whole prepared meals Forage, hay, straw and silage (297 recommended) Fish* and fish products Vegetables and fruit Chemical and pharmaceutical formulations</p> <p><i>*May require descaling and or skinning</i></p>
<b>Sample Size</b>	Up to 14 mm Ø	Up to 10 mm, large inlet up to 40 mm	Maximum 100 ml (50 - 150 g)	(294): 0,1 - 1,5 kg (297): 0.1 - 2.5 kg
<b>Grinding Principle</b>	Two discs, one rotating one stationary	Impeller, abrasive ring, and screen	Rotor blade	Various rotor blade
<b>Grinding Rate/Time</b>	Appr. 3 g/s	Appr. 4 g/s	2 to 10 seconds	20 to 60 s
<b>Grinding Speed</b>	Grinding disc 3.000 rpm	Impeller 10.000 rpm	Blade 20.000 rpm	(294): Blade 1.500 rpm (297): Blade 1.500/3.000 rpm
<b>Particle Size</b>	Coarse grist	Fine and uniform grist	Depending on sample	Depending on sample
<b>Timer</b>	No	No	Yes	No
<b>Safety</b>	Microswitch	Microswitch	Microswitch	Magnetic safety switch
<b>Cleaning</b>	Low cross contamination	Low cross contamination	Manual	Manual

# Ordering information

## CM 190 Cemotec™

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- CM 190 Cemotec™ complete with hardened Grinding Discs, disposable Sample Bottles (20), Allen Keys 4 and 5 mm, Hopper with cover, User's Manual, 200-230 V, 50-60 Hz
- Same as above but for 115 V, 50-60 Hz

### Accessories

- Disposable Sample Bottles (150 ml) of polypropylene with snap on lid 100/pkg
- Disposable Sample Bottles (150 ml) of polypropylene with snap on lid 500/pkg
- Grinding Discs (1 pair)
- Seal for Sample Bottle

## CT 193 Cyclotec™

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- CT 193 Cyclotec™ complete with 2 Sample Bottles (125 ml) with snap-on lid, screens 0.5 and 1.0 mm, Allen Keys 4 and 6 mm, Seal for Grinding Chamber, Paper Bag for Dust Collection, Seal for Samples Bottle, User's Manual, 200-230 V, 50 Hz
- Same as above but for 115 V, 60 Hz
- Same as above but for 200-230 V, 60 Hz
- Same as above but for 115 V, 50 Hz

### Accessories

- Sample Bottles with lids, dark glass for UV protection, 125 ml, case of 104
- Sample Bottles with lids, dark glass for UV protection, 125 ml, case of 52
- Lid for Sample Bottles
- Large Inlet/Forage Assembly Kit
- Dust Collection with external connection
- Paper Bags for Dust Collection, pack of 10
- Dust Filter Pad
- Screen 0.3 mm (use together with 1 or 2 mm Screen)
- Screen 0.5 mm
- Screen 0.8 mm
- Screen 1.0 mm
- Seal for Sample Bottle
- Seal for Grinding Chamber
- Seal for Dust Filter Cover
- Seal Kit
- Impeller, Standard
- Impeller, Nickel-plated
- Holder for 500 ml Sample Bottle
- Sample Bottle 500 ml with lid, 1 pcs
- Grinding Ring, made of tungsten carbide – Standard
- Grinding Ring for Hard Sample
- Steel Grinding Strip, self-adhesive, set of 3

## KN 195 Knifetec™

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- KN 195 Knifetec™ complete with rotor blade, PVC tubing 4m, tubing clamp, User's Manual, 230 V, 50-60 Hz
- Same as above and also including Transformer for 115 V operation, 50-60 Hz

### Accessories

- Rotor blade standard, complete
- Rotor blade with sharp knives, complete
- Rotor blade for small volume
- Rotor blade for pellets
- KN 195 Knifetec™ lid for pellets
- Disposable Sample Bottles (150 ml) of polypropylene with snap-on lid 100/set
- Disposable Sample Bottles (150 ml) of polypropylene with snap-on lid 500/set
- Stainless steel tray

## HM 294 Homogeniser

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- Homogeniser complete with Stainless Steel Bowl (3.5 l), multipurpose cutter with microteeth blades, transparent lid and User's Manual, 1.500 rpm, 1 x 230 V, 50 Hz
- Same as above but for 1 x 115 V, 60 Hz

### Accessories

- Stainless steel bowl. 3.5 l
- Cutter with smooth blades
- Cutter with microteeth blades
- Grindstone for blades

## HM 297 Homogeniser

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- Homogeniser 1500 / 3000 rpm, 3 phase, 400 V, 50Hz, complete with Stainless steel bowl 5.5 l, Cutter with microteeth blades, transparent lid with integrated scraper and User Manual
- Homogeniser, variable speed up to 1500rpm, 1-phase, 115 V, 60 Hz, complete with Stainless steel bowl 5.5 l, Cutter with microteeth blades, transparent lid with integrated scraper and User's Manual

### Accessories

- Stainless Steel Bowl 5.5 litres, 2097
- Cutter with Smooth Blades, 2097
- Cutter with Micro Teeth Blades, 2097
- Grind Stone for Blades

Ordering information: Use the above specified Cat. No. together with the text.

# Installation requirements

## CM 190 Cemotec™

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Power supply:	200-230 V, 50-60 Hz 115 V, 50-60 Hz
Power consumption:	600 W
Net weight:	18 kg
Dimensions, L x D x H:	220 x 400 x 400 mm
Rotor speed, grinding disc:	3.000 rpm

## CT 193 Cyclotec™

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Power supply:	200-230 V, 50 Hz 115 V, 60 Hz 200-230 V, 60 Hz 115 V, 50 Hz
Power consumption:	600 W
Net weight:	18 kg
Dimensions, L x D x H:	220 x 300 x 400 mm
Rotor speed, impeller:	10.000 rpm

## KN 195 Knifetec™

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Power supply:	230 V, 50-60 Hz Incl. Transformer 115/230 V 115 V, 50 Hz
Power consumption:	120 W
Net weight:	7,5 kg
Dimensions, L x D x H:	190 x 290 x 250 mm
Rotor speed, impeller:	20.000 rpm
Water supply:	2 l/min, 8-10°C

## HM 294 Homogeniser

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Power supply:	230 V, 50 Hz 1-phase 115 V, 60 Hz 1-phase
Power consumption:	500 W
Net weight:	15 kg
Capacity:	3.5 l bowl. 1,5 l liquid content
Rotor speed:	1.500 rpm
Dimensions, L x D x H:	250 x 410 x 300 mm

## HM 297 Homogeniser

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Power supply:	400 V, 50 Hz 3-phase 115 V, 60 Hz 1-phase
Power consumption:	750 W 1-phase / 1400 W 3-phase
Net weight:	25.5 kg
Capacity:	5.5 l bowl. 2,5 l liquid content
Rotor speed:	1.500 rpm (1-phase) 1.500 and 3.000 rpm (3-phase)
Dimensions, L x D x H:	270 x 460 x 400 mm

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