FOSS

Mill Collection
CT 293 Cyclotec™, CM 290 Cemotec™, KN 295 Knifetec™, Hammertec™, 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; the CM 290 Cemotec™ for grinding solid samples without moisture loss; the CT 293 Cyclotec™ for uniform grinding of dry samples and the KN 295 Knifetec™ for the preparation of high-fat, high-moisture and fibrous samples, the Hammertec™ which is specially designed for falling number analysis and the HM 294 Homogeniser and HM 297 Homogeniser for rapid homogenization of larger samples with a high fat or oil content.

Sample

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

Dedicated Analytical Solutions

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 to use. The Mill Collection covers a broad range of grinding applications, including preparation for traditional wet chemistry, falling number analysis and NIR/NIT analysis.

Ensuring reliable analysis

The Mill collection consists of high quality products that ensure reliability and reproducibility of the analysis. CM 290 Cemotec™, CT 293 Cyclotec™, KN 295 Knifetec™, Hammertec™ 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 293 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 290 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 295 Knifetec™:

For high fat, high moisture and fibrous sample.

- Up to 200ml sample (30-200g)

Hammertec™:

Sample preparation for falling number analysis, wet gluten analysis, Kjeldahl and NIR analysis

- Suitable for dry, flowable whole cereal grain samples

HM 294 Homogeniser and HM 297 Homogeniser:

For high fat, high moisture and fibrous samples

- HM 294 0.1 – 1.5 kg sample capacity (1.5 litre max)
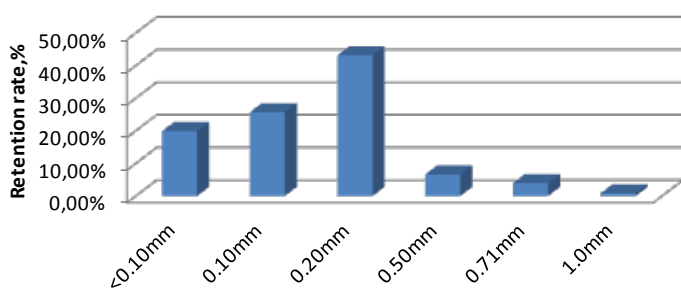- HM 297 0.1 - 2.5 kg sample capacity (2.5 litre max)

Technology

CM 290 Cemotec™

CM 290 Cemotec™

Sample grinding without moisture loss

The CM 290 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 290 Cemotec™ particles size distribution

CM 290 Cemotec™ can be used for dry and low fat samples, up to 15 % Moisture and 10 % Fat.

Description:

The CM 290 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 dial to control the fineness of the grist.

Accessories

- Glass sample bottles 350 ml 4 or 40 pcs/pkg
- Wirebrush and brush

Benefits:

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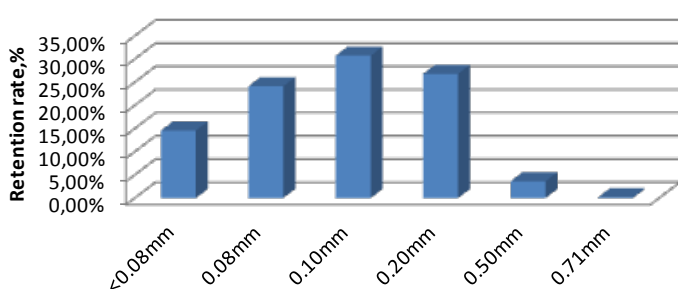- Low noise level
- Low maintenance demand

CT 293 Cyclotec™ with standard sample inlet and 350 ml glass bottle

CT 293 Cyclotec™

Rapid sample preparation for general laboratory analysis

The CT 293 Cyclotec™ offers a very rapid and convenient sample preparation in a variety of analytical techniques such as infrared spectroscopy, Kjeldahl, fibre determination and solvent 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 293 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 293 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, enabling 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
- Range of screens: 0.3 mm, 0.5 mm, 0.8 mm, 1 mm (0.5 and 1.0 is included) and 2 mm
- Glass sample bottles 350 ml 4 pcs/pkg and 40 pcs/pkg
- Dust collection options
  - Dust pads
  - Dust collection with external connection
- Grinding rings
  - Grinding ring for Hard samples
  - Grinding ring for Heavy metals
  - Grinding ring standard, Tungsten carbide
- Impellers
  - The standard impeller in aluminium
  - Nickel plated – for mineral analysis

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 295 Knifetec™

KN 295 Knifetec™

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

The KN 295 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 295 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 aluminium chamber and the removable rotor blade of the KN 295 Knifetec™ simplify sample removal and cleaning between samples.
Removable sample bowl with lid for easy sample handling.

Benefits:

• Timer controlled
• Integral 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 sharp - standard:** The vast majority of applications work perfectly with this standard rotor blade.

• **Rotor blade for small sample volumes**
The blades are situated lower in the bowl than the standard rotor blade. In addition is 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.

Hammertec™

Hammer mill for falling number analysis

The Hammertec™ is specially designed for falling number analysis, wet chemistry and NIR analysis. It is an excellent mill for all types of sample preparation where the requirements for fineness and uniformity of particle size are high.
Suitable for dry, flowable whole cereal grain samples

Description:

Built with a focus on the user, the Hammertec makes hammer mill operations quieter by at least 1,5 dB compared to existing solutions. It is also smaller and lighter than older mills, reducing the risk of injury to lab staff while its innovative design helps to avoid sample carry-over, ensuring more accurate results.

Benefits:

- Low noise eliminates need to use ear protection
- 20% lighter than current mills making it easier to move
- Almost 60% smaller than equivalent mills taking up less room on your bench
- Cyclone sample outlet for convenient sample collection
- Easy to clean parts and exchange the rotor belt
- Non stick materials prevent sample carryover
- Meets AACCI/ICC/ISO requirements for falling number analysis

Exchangeable rotor belt

Exchanging the rotor belt on your mill has never been easier. Designed with easy access to the belt, makes it possible even for non-experts to replace hassle free.

Accessories

- Auto feeder
- Sample outlet bag
- Sample brusher
- Flat belt
- Sample bag
- Sample funnel with adaptor
- Sample outlet adaptor
- Sample collection with filter cloth
- Sample filter 0.8 mm
- Sample filter 0.5 mm
- Sample filter 1.0 mm

Optional autofeeder

Meets requirements of AACCI/ICC/ISO methods

AACC: Sample mill, with 0.5- or 0.8-mm screen to produce meal with particle size distribution as follows: >500 µm, 0–10%; >210 but <500 µm, 25–40%; <210 µm, 75–50%.
ISO: Laboratory mill, hammer type, and fitted with a 0,8 mm screen allowing the production of a wholemeal product meeting the particle size specification shown in 8.1.3.

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, 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 microteeth blade (included) and smooth blade
- Extra bowls

Smooth (left) and microteeth (right) cutterblades

HM 297 Features and benefits

- Powerful 2 speed (3000/1500 rpm) 400V 50Hz three phase motor
- Variable speed (up to1500 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

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

Extended warranty on new instruments with a FossCare agreement

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.

4 YEAR WARRANTY
with all FossCare Premium Preventive Maintenance Agreements

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 290 Cemotec™	CT 293 Cyclotec™	KN 295 Knifetec™	Homogenisers	Hammertec™
Sample Type	Dry samples up to 15% Moisture and 10% Fat, such as: Grains, Cereals Seeds Beans Dry granular foods Pelleted feed	Dry samples up to 15% Moisture and 10% Fat, such as: Grains, Cereals Seeds Petfood pellets Hay, straw (dried and cut to 2-3 cm) Silage (dried and cut to 2-3 cm) Pelleted feed Leaves Tobacco	High-moisture, high-fat and fibrous samples, such as: 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	High-moisture, high-fat and fibrous samples, such as: Meat and meat products Whole prepared meals Forage, hay, straw and silage (297 recommended) Fish* and fish products Vegetables and fruit *May require descaling and or skinning*	Dry, flowable whole cereal grain samples
Sample Size	< 14 mm (If larger a pre-crushing is needed)	Up to 10 mm, large inlet up to 40 mm	Maximum 200 ml, (30 - 200 ml)	(294): 0,1 - 1,5 kg (297): 0.1 - 2.5 kg	Up to 10 mm, large inlet up to 40 mm
Grinding Principle	Two discs, one rotating one stationary	Impeller, abrasive ring, and screen	Rotor blade	Various rotor blade	Hammer Mill
Grinding Rate/Time	Appr. 3 g/s	Appr. 4 g/s	2 to 10 seconds	20 to 60 s	300 g in less than 60 seconds at 13% moisture level, depending on sample type and moisture content
Grinding Speed	Grinding disc 3.000 rpm	Impeller 10.000 rpm	Blade 16.000 rpm	(294): Blade 1.500 rpm (297): Blade 1.500/3.000 rpm	16800 rpm
Particle Size	Coarse grist	Fine and uniform grist	Depending on sample	Depending on sample	ISO 3093, or equivalent
Timer	No	No	Yes	No	No
Safety	Microswitch	Microswitch, motor brake	Microswitch, solenoid	Magnetic safety switch	Safety brake Microswitch
Cleaning	Low cross contamination	Low cross contamination	Manual	Manual	Low cross contamination

Ordering information

CM 290 Cemotec™

- CM 290 Cemotec™ complete with hardened Grinding Discs, Funnel, Funnel lid, Glass sample bottle 350 ml 4pcs/pkg, Wirebrush, Brush, User Manual and Quick guide, 200-230 V, 50-60 Hz
- Same as above but for 115 V, 50-60 Hz

Accessories

- Glass sample bottles 350 ml 4 pcs/pkg and 40 pcs/pkg
- Wirebrush
- Brush
- Funnel with lid
- Grinding Discs (1 pair)

CT 293 Cyclotec™

- CT 293 Cyclotec™ complete with Glass sample bottle 350 ml 4pcs/pkg, Screen 0.5 and 1.0mm, Brush, Dust pad 5 pcs, Tube brush, Silicone Plug, Hexagon and Allen wrench, Grinding ring standard, Belt Tension Adjust Assembly, User manual, Quick guide, 200-230 V, 50 Hz
- Same as above but for 115 V, 60 Hz

Accessories

- Glass sample bottle 350 ml 4 pcs/pkg and 40 pcs/pkg
- Large Inlet/Forage Assembly Kit
- Dust Collection with external connection
- Dust pads 20 pcs/pkg
- Screen 0.3 mm
- Screen 0.5 mm
- Screen 0.8 mm
- Screen 1.0 mm
- Screen 2.0 mm
- Impeller, Standard
- Impeller, Nickel-plated
- Grinding ring, for Hard samples
- Grinding ring for Heavy metals
- Grinding ring, Grinding ring standard, tungsten carbide

KN 295 Knifetec™

- KN 295 Knifetec™ complete with Rotor blade Sharp Standard, Scraper, Tube Clamp, PVC tubing 2 m, Glass sample bottle 350 ml 4 pcs/pkg, Aluminium bowl, aluminium lid, Stainless steel tray, 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 sharp, standard
- Rotor blade for small volume
- Rotor blade for pellets
- Pellet Lid Assembly

- Glass sample bottles 350 ml 4 pcs/pkg and 40 pcs/pkg
- Stainless steel tray
- Aluminium bowl, aluminium bowl lid
- Scraper
- Brush
- Transformer 115V/230V

Hammertec™

Hammertec™, complete with Auto-feeder, Sample outlet adaptor, Sample funnel with adaptor, Flat belt, Sample bag, Sample brusher, Sample filter 0.8 mm, Package box, Owner's guide, Spare Parts Manual, Manual box, 100-120 VAC 60 Hz

Accessories

- User's Manual
- Sample brusher
- Flat belt
- Sample bag
- Sample funnel with adaptor
- Sample outlet adaptor
- Sample collection with filter cloth
- Sample filter 0.8 mm
- Sample filter 0.5 mm
- Sample filter 1.0 mm

HM 294 Homogeniser

- 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

- 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

Installation requirements

CM 290 Cemotec™

Power supply:	200-230 V, 50-60 Hz
	115 V, 50-60 Hz
Power consumption:	450
Net weight:	21,3 kg
Dimensions, L x D x H:	167 x 385 x 350 mm
Rotor speed, grinding disc:	3.000 rpm

CT 293 Cyclotec™

Power supply:	200-230 V, 50 Hz
	115 V, 60 Hz
Power consumption:	600 W
Net weight:	21,2 kg
Dimensions, L x D x H:	317 x 307 x 452 mm
Rotor speed, impeller:	10.000 rpm

KN 295 Knifetec™

Power supply:	230 V, 50-60 Hz
Power consumption:	600 W
Net weight:	7,5 kg
Dimensions, L x D x H:	190 x 322 x 237 mm
Rotor speed, impeller:	16.000 rpm
Water supply:	2 l/min, 10-15°C

Hammertec™

Power supply:	200-240 VAC 50/60 Hz
	100-120 VAC 50/60 Hz
Power consumption:	1300 W
Weight:	40.6 kg
Dimension: (wxdxh)	240 x 555 x 460 mm
Noise:	Less than 80 dB
Temperature:	In door use, 5-40 ˚C

HM 294 Homogeniser

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

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