



## ULTRA SANTRIFÜJ DEĞİRMEN ZM 300

**Rotor mills are used for high-speed size reduction of soft to medium-hard as well as temperature-sensitive or fibrous materials.**

The powerful Ultra Centrifugal Mill ZM 300 provides maximum grinding performance combined with ease of use. The variable speed from 6,000 to 23,000 rpm allows for gentle, neutral-to-analysis sample preparation in a very short time.

Thanks to an integrated temperature monitoring system, reproducibility is guaranteed even for long grinding processes or pulverization of large sample volumes.

The wide selection of rotors, ring sieves and cassettes makes the ZM 300 a true allrounder which meets the requirements of a great variety of size reduction tasks.



[Videoyu izlemek için tıklayın](#)

## THE STANDARD FOR FOOD & FEED

- | Gentle high-speed pulverization due to pre- and fine grinding in one working run
- | Optimum process control and reproducibility based on monitoring of the cassette temperature
- | Patented cassette system for maximum sample recovery and easy cleaning
- | Optional cassette for sample volumes up to 600 ml
- | Wide speed range from 6,000 to 23,000 rpm
- | Defined final fineness due to ring sieves with aperture sizes from 0.08 – 10 mm
- | Collecting vessels for sample volumes from 250 ml to 4.5 l
- | Automated vibratory feeder and various cyclone systems available



SHORT PROCESSING TIMES

## AVOID EXCESSIVE HEAT GENERATION AND MOTOR OVERLOAD

The speed range from 6000 to 23000 rpm allows for optimum adaptation of the grinding process to the sample requirements by keeping the grinding time as short as possible and the temperature increase as moderate as possible. Too much heat may have a negative effect on the grinding results, for example, if moisture or volatile components escape.

The ZM 300 is equipped with an integrated temperature sensor which measures the temperature of the cassette lid near the ring sieve. The measured temperature is constantly shown in the mill's display, allowing the user to optimize the grinding process and improve reproducibility.



## ULTRA SANTRİFÜJ DEĞİRMEN ZM 300

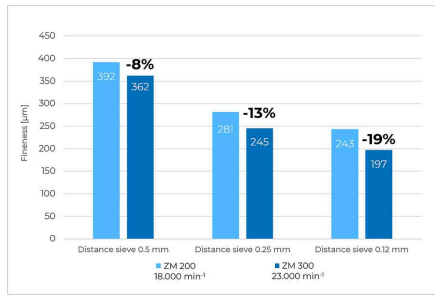
# FINER END PRODUCTS AND HIGHER SAMPLE THROUGHPUT

### APPLICATION EXAMPLES

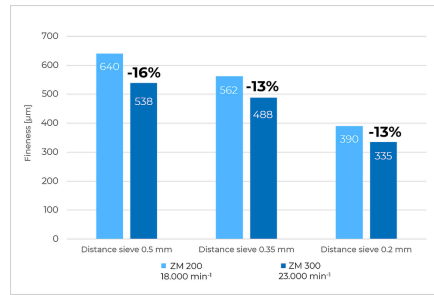
Grind sizes of plastic materials (POM or PP) after grinding with different sieves and speeds. The speed of 23,000 rpm results in a higher fineness for all sieves compared to grinding at 18,000 rpm. For example, a 19 % reduction in fineness can be achieved when POM is ground with a 0.12 mm distance sieve at 23,000 rpm.

The maximum sample throughput, e.g. when crushing chicken feed with a 0.5 mm ring sieve, could be increased by 16% when crushing at maximum speed of 23,000 min<sup>-1</sup> instead of 18,000 min<sup>-1</sup>.

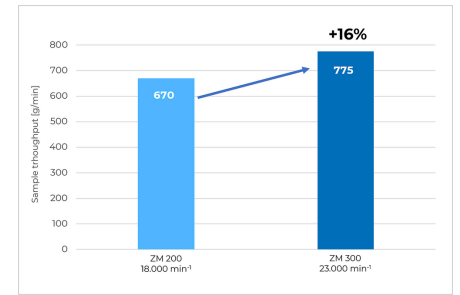
### POLYMER POM



### POLYMER PP



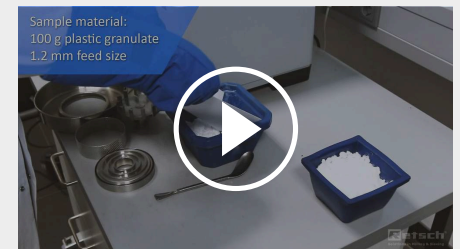
### GRINDING ANIMAL FEED



### KRİYOJENİK ÖĞÜTME

Cryogenic or cold grinding is the ideal solution for pulverizing samples that cannot be reduced to the required fineness at room temperature. This procedure involves the use of grinding aids such as liquid nitrogen (-196 °C, embrittlement of the sample outside the mill) or dry ice (-78 °C, sample/dry ice mixture) to embrittle the sample material by cooling, and thus improve the breaking behavior.

In addition, highly volatile components are better preserved in the sample by cooling. Cryogenic grinding is easy to perform with the ZM 300 and is recommended especially for plastics or very temperature-sensitive samples. The video shows the process with the predecessor model ZM 200, which is identical in the ZM 300.



[Videoyu izlemek için tıklayın](#)

This video shows dryice grinding of plastic granules with the ZM 200 which also applies to the ZM 300.

ULTRA SANTRIFÜJ DEĞİRMEN ZM 300

## IDEAL FOR LIGHT & HEAT-SENSITIVE MATERIALS

In combination with the cyclone suction unit, the Ultra Centrifugal Mill ZM 300 mill is even suitable for grinding light and heat-sensitive materials.

- | Efficient cooling of sample and grinding tools
- | Improved sample discharge from the grinding chamber
- | Particularly suitable for large volumes
- | The cyclone accommodates sample bottles of 0.25, 3 and 5 liters
- | Ideal for cryogenic grinding



## ACCESSORIES FOR ZM 300



### RING SIEVES

For the ZM 300 ring sieves with reinforced rim are used which are equipped with four grooves for secure locking. Distance sieves, also secured and fixed by four grooves, have a gap between the sieve mesh and the rotor, which reduces shearing effects and thereby heat generation.



### ROTORS

Rotors are available with either 6, 12 or 24 teeth. The standard rotor with 12 teeth is suitable for almost any material and requirement. For fibrous samples, such as straw, the rotor with 6 teeth is typically used, while for fine samples the rotor with 24 teeth is best suited.



### HEAVY-METAL-FREE GRINDING

For neutral-to-analysis work, or for pulverizing abrasive samples, grinding tools in various materials are available: titanium (titanium-niobium coating), steel 1.4404, tungsten carbide coating.



### COLLECTING VESSELS

In the standard collecting vessel with 900 ml nominal volume, up to 300 ml of sample can be ground in one working step. With the large-volume cassette, the useful volume can be doubled to 600 ml. When utilizing a cassette with cyclone, various collecting vessels up to 4,500 ml useful volume are available.



### BESLEYICI DR 100

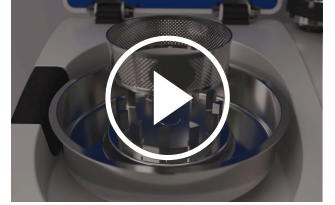
The Vibratory Feeder DR 100 is controlled via an interface and conveys material in a load-dependent manner to the hopper of the ZM 300. This procedure ensures uniform grinding with maximum sample feed. The use of a feeder is particularly advantageous for large sample quantities.

ULTRA SANTRIFÜJ DEĞİRMEN ZM 300

## CONVENIENT OPERATION – EASY CLEANING

The large touch display with rotary knob facilitates the setting of all grinding parameters and provides current values such as cassette temperature and motor load.

Thanks to the screwless push-fit system and the patented cassette principle, grinding tools can be inserted and removed by hand. Plug-in rotors and ring sieves enable quick and easy cleaning. All components that come into contact with the product can be cleaned using running water or a dishwasher.



[Videoyu izlemek için tıklayın](#)

ULTRA SANTRIFÜJ DEĞİRMEN ZM 300

## TIPIK ÖRNEK MALZEMELER

The ZM 300 is suitable for grinding a wide variety of materials:

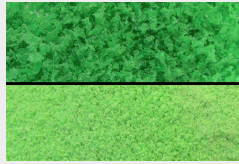
waste, graphite, collagen, drugs, fertilizers, feed pellets, grains, spices, rubber, wood, coffee beans, bones, coal, food, corn, minerals, paper, plant parts, polymers, powder coatings, rice, seeds, straw, sweets, tobacco, textiles, chemical products, electronic components, dried fruits and vegetables, dried larvae, pharmaceutical products.



Toz boyalar



Kahve çekirdekleri



PET flakes



Otlar



[Videoyu izlemek için tıklayın](#)

Parsley

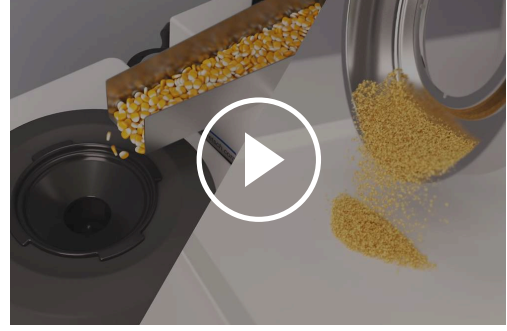
Örnek hazırlama göreviniz için en iyi çözümü bulmak için uygulama veri tabanımızı ziyaret ediniz

## ULTRA SANTRIFÜJ DEĞİRMEN ZM 300

### FONKSİYON PRENSİBİ

The grinding process is carried out by impact and shearing forces between the rotor and the fixed ring sieve. The sample material is fed into the rotor via a funnel with splash protection, accelerated outwards by centrifugal force, and pre-ground by the wedge-shaped rotor teeth. The subsequent fine grinding takes place in the narrow gap between the rotor and the sieve.

Thanks to this two-stage process, sample preparation is particularly gentle and fast. Since the ground material only remains in the grinding chamber for a short time, the characteristic properties of the sample are retained. The end product is collected in the collection vessel, cyclone, or paper filter bag that surrounds the grinding chamber.



[Videoyu izlemek için tıklayın](#)

<b>Uygulamalar</b>	ince öğütme
<b>Uygulama alanı</b>	biyoloji, kimya .., tarım
<b>Besleme malzemesi</b>	yumuşak, orta sert, kırılğan, lifli
<b>Boyut küçültme prensibi</b>	etki, kesme
<b>Malzeme giriş büyüklüğü</b>	< 10 mm
<b>Çıkış büyüklüğü</b>	< 40 µm
<b>Parti boyutu / besleme miktarı</b>	300 ml with standard cassette 600 ml with volume cassette 4500 ml / 2500 ml / 450 ml / 230 ml with cyclone
<b>Hız, 50 Hz (60 Hz) de</b>	6,000 - 23,000 min-1, free selectable
<b>Rotor hızı</b>	31 - 119 m/s
<b>Rotor çapı</b>	99 mm
<b>Rotor tipi</b>	6-tooth rotor / 12-tooth rotor / 24-tooth rotor
<b>Öğütücü elemanların malzemesi</b>	Paslanmaz çelik, Titanyum, Aşınmaya dayanıklı kaplamalı paslanmaz çelik
<b>Elek boyutu</b>	trapez delikli 0,08 / 0,12 / 0,20 / 0,25 / 0,50 / 0,75 / 1,00 / 1,25 / 1,50 / 2,00 mm // yuvarlak delikleli 3.00 / 4, 00 / 10.00mm
<b>Öğütme süresi ayarı</b>	Hayır
<b>Kollektör kapasitesi</b>	900 ml with standard cassette 1200 ml with volume cassette 5000 ml / 3000 ml / 500 ml / 250 ml with cyclone
<b>Tahrik</b>	Frekans konvertörlü ile 3 fazlı asenkron motor
<b>Güç bağlantısı</b>	1-faz
<b>Koruma kodu</b>	IP 30
<b>Güç tüketimi</b>	1750 VA ((200..240V), 1400 VA (110..120V)
<b>G x Y x D kapalı</b>	452 x 431 x 426 mm
<b>Net ağırlık</b>	~ 38 kg
<b>Standartlar</b>	CE


\* besleme malzemesi ve cihaz yapılandırmasına / ayarlarına bağlıdır

[www.retsched.com.tr/zm300](http://www.retsched.com.tr/zm300)

## SIPARIŞ BİLGİSİ

### ULTRA CENTRIFUGAL MILL ZM 300




**Ultra Centrifugal Mill ZM 300 with 900 ml cassette**  
(please order push-fit rotor and ring sieve separately)

20.824.0001		ZM 300	230 V, 50/60 Hz
20.824.0002		ZM 300	110-120 V, 50/60 Hz

**aynı fiyata diğer elektrikli versiyonlar mevcuttur**

### ACCESSORIES ZM 300 STANDARD

#### PASLANMAZ ÇELIKTEN PUSH-FIT ROTORLAR

02.608.0040		Push-fit rotor	6 diş
02.608.0041		Push-fit rotor	12 diş
02.608.0042		Push-fit rotor	24 diş

#### RING SIEVES OF STAINLESS STEEL, WITH REINFORCED RIM

03.647.0465	Trapez delikler	0.08 mm
03.647.0466	Trapez delikler	0.12 mm
03.647.0467	Trapez delikler	0.20 mm
03.647.0468	Trapez delikler	0.25 mm
03.647.0469	Trapez delikler	0.35 mm
03.647.0470	Trapez delikler	0.50 mm
03.647.0471	Trapez delikler	0,75 mm
03.647.0472	Trapez delikler	1.00 mm
03.647.0473	Trapez delikler	1.50 mm
03.647.0474	Trapez delikler	2.00 mm
03.647.0475	Yuvarlak delikler	3.00 mm

03.647.0476	Yuvarlak delikler	4.00 mm
03.647.0477	Yuvarlak delikler	5,00 mm
03.647.0478	Yuvarlak delikler	6.00 mm


PASLANMAZ ÇELİK MESAFELİ ELEKLER, - SICAKLIĞA DUYARLI VE YAĞLI MALZEMELER İÇİN SR ÖNERİLİR

03.647.0441	Trapez delikler	0.08 mm	
03.647.0442	Trapez delikler	0.12 mm	
03.647.0443	Trapez delikler	0.20 mm	
03.647.0444	Trapez delikler	0.25 mm	
03.647.0445	Trapez delikler	0.35 mm	
03.647.0446	Trapez delikler	0.50 mm	
03.647.0447	Trapez delikler	0,75 mm	
03.647.0448	Trapez delikler	1.00 mm	
03.647.0449	Trapez delikler	1.50 mm	
03.647.0450	Trapez delikler	2.00 mm	
03.647.0451	Yuvarlak delikler	3.00 mm	
03.647.0452	Yuvarlak delikler	4.00 mm	
03.647.0453	Yuvarlak delikler	5,00 mm	
03.647.0454	Yuvarlak delikler	6.0 mm	
03.647.0455	Kare delikler	10.00 mm	ön öğütme için

## ACCESSORIES ZM 300 FOR ABRASIVE PRODUCTS

AŞINMAYA DİRENÇLİ KAPLAMALI PASLANMAZ ÇELİKTEN PUSH-FIT ROTORLAR

02.608.0043  Push-fit rotor 6 diş

02.608.0044  Push-fit rotor 12 diş

02.608.0045  Push-fit rotor 24 diş

GÜÇLENDİRİLMİŞ KENARLI, AŞINMAYA DAYANIKLI KAPLAMALI PASLANMAZ ÇELİK HALKA ELEKLER

03.647.0456	Trapez delikler	0.20 mm
03.647.0457	Trapez delikler	0.25 mm
03.647.0458	Trapez delikler	0.35 mm
03.647.0459	Trapez delikler	0.50 mm
03.647.0460	Trapez delikler	0,75 mm
03.647.0461	Trapez delikler	1.00 mm
03.647.0462	Trapez delikler	1.50 mm
03.647.0463	Trapez delikler	2.00 mm
03.647.0464	Yuvarlak delikler	3.00 mm

ACCESSORIES ZM 300 FOR GRINDING WITHOUT HEAVY-METAL CONTAMINATION

PUSH-FIT ROTOR VE KASET

02.608.0047  Push-fit rotor, 12 diş saf titanyum

22.355.0012 Tamamı titanyum-niyobyum kaplamalı 900 ml kaset (contalı tava ve kapak)


GÜÇLENDİRİLMİŞ KENARLI, SAF TITANYUMDAN HALKA ELEKLER

03.647.0479	Trapez delikler, 0.08 mm	
03.647.0480	Trapez delikler	0.12 mm
03.647.0481	Trapez delikler	0.20 mm
03.647.0482	Trapez delikler	0.25 mm
03.647.0483	Trapez delikler	0.35 mm
03.647.0484	Trapez delikler	0.50 mm
03.647.0485	Trapez delikler	0,75 mm
03.647.0486	Trapez delikler	1.00 mm
03.647.0487	Trapez delikler	1.50 mm
03.647.0488	Yuvarlak delikler	2.00 mm

**SAF TITANYUMDAN MESAFELI ELEKLER**

03.647.0493	Trapez delikler	0.08 mm	
03.647.0550	Trapez delikler	0.12 mm	
03.647.0551	Trapez delikler	0.20 mm	
03.647.0552	Trapez delikler	0.25 mm	
03.647.0553	Trapez delikler	0.35 mm	
03.647.0489	Trapez delikler	0.50 mm	
03.647.0554	Trapez delikler	0,75 mm	
03.647.0490	Trapez delikler	1.00 mm	
03.647.0555	Trapez delikler	1.50 mm	
03.647.0556	Trapez delikler	2.00 mm	
03.647.0557	Yuvarlak delikler	3.00 mm	
03.647.0561	Yuvarlak delikler	4.00 mm	
03.647.0558	Yuvarlak delikler	5,00 mm	
03.647.0559	Yuvarlak delikler	6.0 mm	
03.647.0560	Kare delikler	10.00 mm	ön öğütme için











**CYCLONES ZM 300****SIKLON DAHİL. ÇIKIŞLI VE DESTEKLI KASET TAVA**

22.935.0030	0,25 ve 0,5 litre numune şişeleri ile filtre torbalı siklon
22.935.0028	3 litre toplama hazneli filtre torbalı siklon
22.935.0027	5 litre toplama hazneli filtre torbalı siklon
22.935.0029	0,25 ve 0,5 litre numune şişeleri ile elektrikli süpürge için bağlantılı siklon
22.935.0026	Elektrik süpürgesi bağlantısına sahip siklon, 3 litre toplama hazneli
22.935.0025	Elektrikli süpürge için bağlantılı siklon, 5 litre toplama hazneli
22.935.0042	High-performance cyclone including holder, collecting receptacle (250 ml and 500 ml sample bottle) and 1.5 m FDA certified hose with clamps. Requires 02.010.0060 cassette pan with outlet, stainless steel
22.748.0005	 Değirmenler için endüstriyel elektrikli süpürge, 230 V, 50/60 Hz (diğer elektrikli versiyonlar ve yedek filtre torbaları istek üzerine mevcuttur)

## ACCESSORIES FOR COLD GRINDING ZM 300

22.354.0007 Cryo kit for embrittlement of samples in liquid nitrogen or dry ice snow (incl. 2 insulated containers (1 and 4 liter), 1 spoon spatula, 1 pair of safety glasses)


## ADDITIONAL ITEMS ZM 300

22.355.0018		Kaset komple, paslanmaz çelik, dahil. 900 ml tava, contalı kapak
22.355.0021		Cassette complete, stainless steel, incl. pan 1200 ml, lid with gasket
22.355.0020		Kaset komple, paslanmaz çelik, dahil. çıkışlı tava, contalı kapak
22.355.0012		Tamamı titanyum-niyobyum kaplamalı 900 ml kaset (contalı tava ve kapak)
03.010.0058		Kaset tavası 900 ml, paslanmaz çelik
03.010.0059		Cassette pan 1200 ml, stainless steel
02.010.0060		Çıkışlı kaset tava, paslanmaz çelik
03.010.0062		Kaset tava 900 ml, titanyum-niyobyum kaplama
22.355.0015		Kaset kapak, paslanmaz çelik, contalı
22.355.0011		Cassette lid, titanium-niobium coating, with gasket
22.936.0009		Kaset kapak contası seti, 5 parça
02.011.0078		Siklon için toplama kabı, 5 litre, paslanmaz çelik
02.011.0031		Siklon için toplama kabı, 3 litre, paslanmaz çelik
02.107.0634		Lid for collecting receptacle, 5 litres
02.107.0493		Lid for collecting receptacle, 3 litres
02.186.0010		Naylon filtre torbası, siklon için
01.706.0318		Labyrinth disc
03.114.0092		Gasket for labyrinth disc, 1 piece
03.785.0156		Hazne
03.143.0049		Hopper insert for rebound safety




22.524.0006	Fan için toz filtreli koruyucu ızgara
22.524.0007	Dust filter for ZM 300, 10 pcs.
99.200.0033	IQ/OQ Documentation for ZM 300

## VIBRATORY FEEDER DR 100 FOR ZM 300

### DR 100 motor ünitesi (lütfen besleme kitini ayrıca sipariş edin)

70.938.0001		DR 100 drive unit	220–240 V, 50 Hz
70.938.0002		DR 100 drive unit	110–120 V, 60 Hz
72.020.0018		Feeding kit DR 100-75/40 for ZM 300, incl. push-fit feed chute 75/40 mm, length 250 mm, holder for push-fit feed chute, hopper 3.5 litres and fixture for hopper, stand with data cable	

### PUSH-FIT FEED CHUTE DR 100 FOR ZM 300

03.729.0054		Push-fit besleme oluğu, stainless steel, genişlik 40 mm, uzunluk 250 mm
03.729.0056		Push-fit besleme oluğu, stainless steel, genişlik 75/40 mm, uzunluk 250 mm
03.729.0055		Push-fit besleme oluğu, stainless steel, V şekli, genişlik 40 mm, uzunluk 250 mm