

RETSCH Product Navigator

■ Milling

■ Sieving

■ **Assisting**

Sample Dividers

- PT 100

- PK 1000

- RT 6.5 - RT 75

Vibratory Feeder

- DR 100

Dryer

- TG 100

Cleaners

- UR 1, UR 2, UR 3

Assisting for more efficient grinding processes and sieving analyses



Dividing, Feeding, Drying, Cleaning

From representative, reproducible sampling and sample division to uniform continuous material feed, from the rapid cleaning of milling tools and test sieves to gentle sample drying – RETSCH offers a comprehensive range of useful and cost-effective assistants.

The products are intended for universal use and make working with RETSCH mills and sieve shakers even more comfortable and efficient.

Retsch[®]

Solutions in Milling & Sieving

We are offering you our help

The "Assistants" form the perfect complement to the range of mills and sieve shakers from RETSCH. These universal products will optimise your results, increase your working efficiency and save time and money – benefits that you should take advantage of.



Dividing – as important as the analysis itself!

Errors in sample preparation, above all in dividing the laboratory sample, accumulate in the course of the process and cannot be compensated, even by the most up-to-date analytical instruments.

Only the exact division of the entire sample into representative fractions will guarantee exact and unbiased analytical results!

For quality-conscious manufacturers, processors and supervisors, this means that an exact sample division must be as important as an error-free analysis. Just how large the error can be with different sampling and sample division methods is shown in the diagram below. RETSCH offers sample dividers in accordance with the best sample division methods:

- **Sample Divider PT 100** for dividing the whole sample into representative individual fractions
- **Rotary Tube Sample Divider PK 1000** for extracting representative individual samples from a material flow
- **Sample Splitter RT** for economically priced manual on-site sample dividing

When dividing up the sample there are a few, but important, rules that must be observed:

1. Significance of the minimum divided quantity

For the sub-sample to be representative of the entire bulk, its qualitative properties must correspond to that of the original quantity. In order to comply with this requirement, some basic guidelines should be respected. In particular, this concerns the minimum partial quantity as well as the maximum permissible deviation. There are several application-related guidelines and specifications as to the calculation of the minimum quantity and sampling accuracy. Please refer to DIN 51701, part 2, or the "Guidelines of Preparing Laboratory Samples" from AAFCO (Association of American Feed Control Officials Inc.). Further information is available on Retsch's website, section "Service".

2. Observance of the sample size opening

With all sample dividers used, the sample size opening should be approx. 3 times larger than the maximum particle size. This ensures that even the larger particles can pass through the sample openings uniformly.

3. Exclusion of manual influences

Care must be taken that neither the division process nor the division results are altered by manual influences. This means that the entire fraction obtained must be used for the analysis!

Comparison of different sampling and sample division methods

The diagram shows how large the error can be for different sampling and sample division methods. It can clearly be seen that rotary tube sample dividers produce the smallest qualitative variation (A). They achieve the highest degree of fractionating accuracy and are therefore clearly superior to all other methods. Sample splitters provide the best results of all the manual fractionating methods.

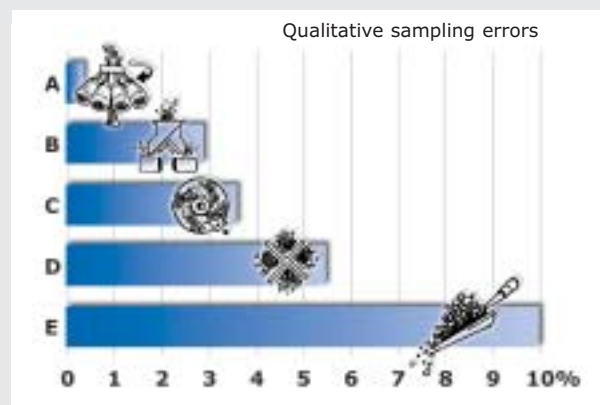
A: Rotary tube sample dividers

B: Sample splitters

C: Disk dividers

D: Heaping and dividing

E: Random sampling (e.g. with a scoop)



Dividing – for improved results and increased working efficiency

The controlled continuous material feed from the RETSCH Feeder DR 100 offers advantages in many respects. Personal Errors resulting from manual feeding are avoided and the results are always reproducible. The RETSCH Feeder DR 100 can be used in many applications. The wide range of accessories allows the instrument to be adapted to suit your own particular requirements.

Feeder DR 100 with RETSCH sample dividers

Uniform and continuous material feed is essential for optimal sample division! Uniform feed means uniform division. This applies in particular to materials with large particles and a wide particle distribution.

This is the reason why RETSCH rotary tube sample dividers should always be used with feeders. For example, if the Sample Divider PT 100 is coupled to the DR 100 via an interface then automatic feeding only starts when the sample divider has reached its proper operation speed.



Feeder DR 100 with RETSCH mills

Using a DR 100 for feeding material to a mill will result in the following advantages:

- Uniform feed of larger amounts
- Easing the load on the operator
- Gentler grinding processes as a result of less material stress. Less material heating means less loss of

volatile substances. The automatic feed protects both the mill and the material whose size is being reduced.

- Avoidance of overloading. The automatic material feed to the Ultra Centrifugal Mill ZM 100 is controlled as a function of load: If the power consumption of the mill increases, less material will be fed. This also means that the size reduction process can be left unattended; this is particularly advantageous when large amounts are being ground continuously.



Feeder DR 100 with other apparatus

RETSCH feeders can also be used with a wide range of other apparatus. While they operate independently from these other instruments, their interface does allow the DR 100 to be individually adapted to suit a particular instrument (such as switching on and off, vibration intensity).



Drying – universal and rapid

Drying in the RETSCH Rapid Dryer TG 100 takes place in a constant flow of warm air. The result is a rapid, gentle and uniform drying process.

The savings in time compared with drying in a drying oven are considerable and **can sometimes be measured in hours**. After drying in the fluidized bed the bulk goods are both pourable and thoroughly mixed.

Many substances have already been successfully dried in the TG 100, e.g.:

- Carbonates, chalk, coal, coke, compost, fertilizers, grain, hops, ion exchangers, metal powders, peat, plant parts, plastics, polymers, rubbish, rubber, salts, sand, sawdust, soil, tea, tobacco, washing powder, waste.
- Apart from bulk goods it is also possible to rapidly dry solid objects which can be installed directly on the instrument, **e.g. test sieves**.



Cleaning – care is required

RETSCH's product range includes three sizes of ultrasonic baths for cleaning test sieves and grinding tools quickly and easily. UR 1 is for test sieves up to 203 mm dia., UR 2 for test sieves up to 400 mm dia., and the UR 3 for the simultaneous cleaning of up to 5 test sieves 200/203 mm dia. The gentle yet thorough cleaning of test sieves in an ultrasonic bath **increases their working lives** as damage which could occur during manual cleaning is avoided.



Do you need any further "Assistants"?

Please let us have your proposals about how we can make working with RETSCH mills and sieve shakers even more convenient for you. We will be grateful for your suggestions!

Sample Divider PT 100



Simply representative division results

RETSCH sample dividers are rotating dividers. They divide the sample so exactly that the composition of each fraction of the sample corresponds exactly to that of the original bulk sample. This procedure guarantees a very high degree of dividing accuracy and reproducibility with both fine and coarse materials. The material feed and dividing processes take place automatically, without interruption and without loss of material. The feed amount can be from a few grams up to 8000 ml depending on the collection vessels used. The maximum feed amount corresponds to the total capacity of the collection vessels used. It is possible to produce an individual number of identical fractions for various applications by the repeated division or combination of fractions.



Sample division made easy

Working with the RETSCH Sample Divider PT 100 is easy and uncomplicated. For example, material feed with the Feeder DR 100 is automatic and synchronized: this means representative sample division right from the start, as the feeder only starts feeding the material when the sample divider has reached its proper running speed. The attached dividing head is simply lifted off for cleaning and exchange purposes.

The sample vessels are also extremely easy to attach with the quick-release clamping system. The new type of quick-release clamping system means that the tiresome mounting of the vessels is no longer necessary.

Overview

- extremely high division accuracy
- modular design
- representative and reproducible division for accurate analysis results
- automatic material feed via synchronized feeder
- simple and rapid handling due to a new type of quick-release clamping system for sample vessels
- speed is monitored and kept constant
- timer
- compact, maintenance-free and easy to clean
- low-noise drive
- CE-conforming
- 2-year warranty

Performance data

PT 100

Applications	sample division, sample reduction
Feed material	bulk materials
Number of divisions	6, 8 or 10
Timer	1 - 60 min or continuous

Technical data

Feed size	≤10 mm
Feed capacity	max. 5000 ml
Flask volume	100, 250 or 500 ml
W x H x D	580 x 910 x 420 mm (incl. DR 100)
Net weight	approx. 33.5 kg (incl. DR 100)

Noise values (noise measuring according to DIN 45635-31-01-KL3)

Measuring conditions: Dividing material: silica sand; particle size <3 mm	
Emission value with regard to workplace	L _{pAeq} 41 dB(A)
Sound power level	L _{WA} 52 dB(A)

Versatile, variable, individual – sample dividing with the RETSCH PT 100

The Sample Divider PT 100 has a modular design and can be put together to suit individual requirements. This means that it offers an extremely flexible and user-friendly range of possible applications. A feeder, various dividing heads, sample receptacle vessels and further useful accessories are available for the drive unit.

Dividing heads with 6, 8 or 10 outlets ensure individual adaptation to the amount and number of individual samples required. The dividing heads are made from coated aluminium or plastic. The former are particularly wear-resistant and, in addition, less sample material remains attached to them. The dividing heads with quick-

release clamps for the sample vessels offer a particularly high degree of operating comfort.

Sample vessels are available in different sizes for various applications. Wide-mouth glass bottles fit the dividing heads as standard. Special dividing heads are also available for use with Duran reagent bottles (100, 250 and 500 ml). These dividing heads can also be equipped with inserts for 30 ml plastic bottles, particularly for the division of small amounts.

For fractions with a low density we recommend the use of a dust cap for the dividing head funnel. The dust cap minimizes both dust losses and generation.

For optimal material feed the Vibratory Feeder DR 100 should be used. PT 100 and DR 100 are connected via an interface and therefore perfectly matched. In addition, the special swivel back stand assures a fixed position of the feeder over the centre of the dividing head inlet which provides for increased accuracy. Further information about the Feeder DR 100 can also be found in this leaflet.

To make the choice easier, RETSCH can supply two complete sets of equipment. The standard set consists of a drive unit and Feeder DR 100 with a stand and an 8-outlet threaded aluminium dividing head. The Comfort set contains an 8-outlet aluminium dividing head with the practical quick-release system. Both sets are supplied with 10 wide-mouth 250 ml sample bottles.



1. Dividing head with quick-release system for wide-mouth bottles
2. Threaded dividing head for wide-mouth bottles
3. Dividing head cover with funnel
4. Dividing head with quick-release system for particle sizes <math>< 5\text{ mm}</math>, for use with Duran bottles and 30 ml beakers
5. Insert for 30 ml plastic beakers

Technology of PT 100

The material to be divided first flows through a decentrally located feed hopper directly into the openings in the dividing head. Even with coarse material, this achieves a very low level of deviations between the materials in the sample flasks. The dividing process itself runs automatically and without manipulation. The dividing head rotates – with speed monitoring – at a constant 110 revolutions per minute, independently of the load and the

main frequency. In specific terms that means that with a dividing head with ten outlets, the feed flow is divided into 1100 individual samples each minute. An optimal dividing accuracy is thus guaranteed. The dividing heads divide the material evenly among the sample vessels. Both wide neck and Duran laboratory flasks are available, depending on the quantity and further application.



Rotating Tube Divider PK 1000



Overview

- exact dividing, also of larger quantities
- adjustable dividing ratio
- extraction of 1-3 samples
- sampling to laboratory scale
- dividing process according to DIN 51701/Pt 4
- batch and continuous operation possible
- simple, safe operation and design conforming to CE safety standards
- easy cleaning
- 2-year warranty

Easily divides large quantities

The RETSCH Rotating Tube Divider is the prerequisite for representative dust-free division and volume reduction of larger bulk samples. It is suitable for powdered or granular bulk materials with particle sizes up to 10 mm. The Rotating Tube Divider can be provided with various bottom cones. Either 1, 2 or 3 samples can be taken depending upon the bottom cone used. The slot width adjusts the ratio of the fractions and therefore the amount of sample. The minimum feed amount should not be less than 100 ml in order to ensure maximum accuracy.

The sample fractions can be collected in containers with a capacity of up to 0.5 litres. The reject collector has a capacity of 30 litres. This means that the dividers are suitable for inclusion in

continuously working laboratory and pilot-plant scale units. All parts coming into contact with the sample material are made from stainless steel or glass. In order to ensure uniform material feed and therefore an increased sample division accuracy, we recommend that the Rotating Tube Divider be used in conjunction with a DR 100 feeder.

The PK 1000 is supplied with 10 x 500 ml sample bottles and a 30 l reject collector as standard. The bottom cone and feeder should be selected according to your particular requirements. A PK 1000 standard set is also available as a complete unit. This contains a bottom cone with one sample outlet and a Sample Feeder DR 100 with feeding kit and push-fit 75 mm feed chute.

Performance data	PK 1000
Applications	sampling and sample dividing
Feed material	bulk materials
Number of divided samples	1 - 3
Timer	digital, 1 - 99 min or continuous

Technical data	with 1 sample outlet	with 2 sample outlets	with 3 sample outlets
Available bottom cones	with 1 sample outlet	with 2 sample outlets	with 3 sample outlets
Slot width, continuously adjustable	0 - 72.5 mm	0 - 110 mm	0 - 53 mm
Max. dividing ratio	1 x 1:11	2 x 1:7.2	3 x 1:15
Min. dividing ratio*	1 x 1:26	2 x 1:26	3 x 1:26
Feed size	≤10 mm	≤10 mm	≤10 mm
Volume of reject collector	30 litres		
W x H x D	560 x 1150 x 700 mm		
Net weight	approx. 37 kg (without DR 100)		

* for a maximum particle size of 10 mm.
for smaller maximum particle sizes the division ratio increases accordingly

Noise values (noise measuring according to DIN 45635-31-01-KL3)

Measuring conditions: Dividing material: silica sand; particle size <3 mm

Emission value with regard to workplace	L_{pAeq} 69 dB(A)
Sound power level	L_{WA} 63 dB(A)

Technology of PK 1000

The material to be divided passes through the feed hopper via the chute of the vibratory feeder into the rotating tube divider. The total material stream is distributed evenly at a constant speed (50 min⁻¹) over the pitch circumference of the lower cone by the tube rotating within the upper cone. The inter-

changeable lower cones have one, two or three continuously adjustable sample slots. In the course of each rotation a separated quantity corresponding to the width of the slot is deposited in the sample collecting vessel. The rest passes into the reject container.



Calculating the slot width for the PK 1000

The maximum dividing ratio depends on the maximum slot width which can be set on the bottom cone. This differs between the three bottom cones which are available (see Table). The smallest dividing ratio depends upon the maximum particle size of the sample since the slot width should be at least 3 times wider than the maximum particle size.

This means that smaller fractions can be taken from smaller particle sizes. The slot width "X" to be set can be calculated from the ratio of the re-

quired fractional amount "QT" to the initial sample amount "QA" multiplied by the fixed pitch circumference "U" of the bottom cone (U = 795 mm for all bottom cones).

$$X = \frac{QT}{QA} * U$$

Example: A representative sample of 250 ml is to be taken from an initial sample amount of 5000 ml. This means that the slot width must be set to 40 mm.



Sample Splitters RT 6.5 - RT 75

Quick and Easy Manual Dividing

RETSCH sample splitters are used for the simple dividing and reduction of



bulk materials of all kinds. Sample Splitters are ideal for the on-site reduction of sample material. They are easy to use, easy to clean and do not need an electrical power supply. Depending on the particle size, material and particle size distribution, the opening width of the passage should be 2.5 - 3 times greater than the diameter of the largest particle (particle size factor). Each sample splitter consists of one dividing head, one stand and three receptacles.

Overview

- usable in the laboratory and on-site
- high-precision manual dividing process
- simple and quick to clean
- dividing process to DIN 51701, Part 4
- inexpensive
- available in 6 sizes

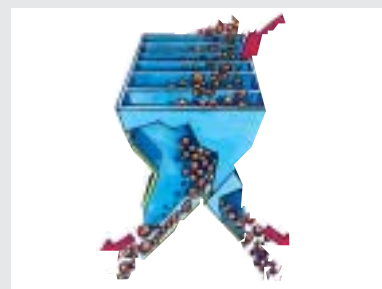
Technical data	RT 6.5	RT 12.5	RT 25	RT 37.5	RT 50	RT 75
Slot size	6.3 mm	12.5 mm	25.0 mm	37.5 mm	50 mm	75 mm
Number of slots	12	18	16	12	8	6
Max. feed size*	approx. 4 mm	approx. 8 mm	approx. 16 mm	approx. 25 mm	approx. 33 mm	approx. 50 mm
Max. feed charge	5 litres			16 litres		
Material of dividing head	stainless steel			sheet steel, hot-dip galvanized		
Material of stand	sheet steel, painted			sheet steel, hot-dip galvanized		
Material of receptacles	tin plate			sheet steel, hot-dip galvanized		
W x H x D	300 x 270 x 250 mm			620 x 420 x 260 mm		
Net weight	approx. 3.5 kg			approx. 12.5 kg		

* with a 5-10% fraction of the maximum particle size

Technology of Sample Splitters

With sample splitters, one of the receptacles is used to pour a well mixed sample evenly into the dividing head. The material runs through the alternately arranged passages in the opposite direction into the two collecting receptacles

under the dividing head outlets. With every operation the feed sample is halved. This can be repeated as many times as necessary until the required dividing quantity has been obtained.



Order data sample dividers

Sample divider PT 100						Item No.
PT 100 drive unit (without dividing head, vibratory feeder/stand, sample receptacles)						
PT 100 drive unit for 100-120/200-240 V, 50-60 Hz						40.534.0002
PT 100 standard sets (including dividing head 8 threaded outlets, DR 100 standard set* and 10 wide-mouth bottles 250 ml)						
PT 100 standard set for 220-240 V, 50 Hz						40.534.0003
PT 100 standard set for 110-120 V, 60 Hz						40.534.0004
PT 100 comfort sets (including dividing head 8 quick-release outlets, DR 100 standard set* and 10 wide-mouth bottles 250 ml)						
PT 100 comfort set for 220-240 V, 50 Hz						40.534.0005
PT 100 comfort set for 110-120 V, 60 Hz						40.534.0006
Dividing heads for PT 100						
	material	sample outlets	feed size	sample vessels	vessel fixation	
	aluminium hard-anodized	8	up to 10 mm	wide-mouth bottles	thread	42.793.0004
	aluminium hard-anodized	8	up to 10 mm	wide-mouth bottles	quick-release	42.793.0001
	aluminium hard-anodized	10	up to 10 mm	wide-mouth bottles	quick-release	42.793.0002
	aluminium hard-anodized	6	up to 10 mm	wide-mouth bottles	quick-release	42.793.0003
	POM	8	up to 10 mm	wide-mouth bottles	quick-release	42.793.0007
	aluminium hard-anodized	8	up to 5 mm	Duran laboratory bottles	quick-release	42.793.0009
Sample vessels for PT 100				30 ml	100 ml	250 ml
Wide-mouth bottles, 10 pieces				-	-	22.523.0001
Duran laboratory bottles, 10 pieces				-	22.523.0003	22.523.0004
Spare beaker with cover 30 ml, 10 pieces				42.156.0001	-	-
Accessories for PT 100						
Support with beakers 30 ml and lids, 8 pieces (for dividing head 42.793.0009)						42.018.0001
Hopper, stainless steel, volume 2.8 l (for PT 100 used without DR 100)						03.785.0135
Protective dust cap for hopper, of POM						03.742.0013
Stand for Vibratory feeder DR 100 on PT 100						42.742.0011
Rotating tube divider PK 1000						Item No.
PK 1000 (without bottom cone, with 10 wide-mouth bottles 500 ml and with reject collector 30 litres)						
PK 1000 for 220-240 V, 50/60 Hz						40.411.0001
PK 1000 for 100-120 V, 50/60 Hz						40.411.0006
PK 1000 standard sets (complete with vibratory feeder DR 100*, feeding kit with push-fit feed chute 75 mm and bottom cone with one sample outlet, 10 wide-mouth bottles 500 ml and reject collector 30 litres)						
PK 1000 standard set for 220-240 V, 50 Hz						40.411.0010
PK 1000 standard set for 100-120 V, 60 Hz						40.411.0011
Bottom cone for PK 1000		sample outlets	slot width	max. dividing ratio		
		1, adjustable	72.5 mm	1:11		42.787.0000
		2, adjustable	110.0 mm	2 x 1: 7.2		42.787.0003
		3, adjustable	53.0 mm	3 x 1:15		42.787.0004
Sample vessels for PK 1000						
Wide-mouth bottles 250 ml, 10 pieces						22.523.0001
Wide-mouth bottles 500 ml, 10 pieces						22.523.0002
Beaker glasses, 50 ml, 10 pieces (usable with adapter 42.001.0007)						32.041.0001
Collecting bags of plastic, 100 pieces						42.042.0001
Accessories for PK 1000						
Adapter for beaker glasses, 50 ml, 1 piece						42.001.0007
Spare reject collector, 30 l						05.010.0004
Sample splitters RT 6.5 - RT 75						Item No.
Sample splitters RT 6.5 and RT 12.5 (incl. 3 receptacles 2.5 litres each, stand and dividing head)						
Sample splitter RT 6.5 with 12 slots 6.3 mm						40.610.0001
Sample splitter RT 12.5 with 18 slots 12.5 mm						40.610.0002
Sample splitters RT 25, RT 37.5, RT 50 and RT 75 (incl. 3 receptacles 8 litres each, stand and dividing head)						
Sample splitter RT 25 with 16 slots 25.0 mm						40.610.0003
Sample splitter RT 37.5 with 12 slots 37.5 mm						40.610.0004
Sample splitter RT 50 with 8 slots 50.0 mm						40.610.0005
Sample splitter RT 75 with 6 slots 75.0 mm						40.610.0006
Spare parts for sample splitters						
Spare receptacle 2.5 litres (for RT 6.5 and RT 12.5)						42.147.0001
Spare receptacle 8.0 litres (for RT 25, RT 37.5, RT 50 and RT 75)						42.147.0002

*Accessories for DR 100 see final page

Vibratory Feeder DR 100



Even, continuous feeding

The RETSCH vibratory feeder is used for the even, continuous feeding and conveyance of pourable bulk materials and fine powders. The DR 100 feeds RETSCH mills and sample dividers, as well as balances and particle measuring devices, and they are suitable for filling, dosing and feeding. The capacity, adaptability and compact design make these devices highly versatile in use. The RETSCH vibratory feeders are available in various designs. The DR 100 can also be driven and controlled externally via the built-in interface.

RETSCH vibratory feeders guarantee reproducibly, exact results and the

economic use of downstream laboratory and testing devices. The DR 100 is easy to set up and operate. For the feed of pourable powders and fine-grain bulk materials, we recommend the feeding kits with 15 mm chute width, and for granulates and coarser materials the feeding kits with 40 mm or 75 mm chute width. The conveying rate is infinitely adjustable. Depending on the feed material, device and setting, it can range from 0 to about 5 l/min. Coated chutes, a vibrating tube and a V-shape chute are available on request, for example chutes of aluminium which are well suited for samples containing fat or oil.

Examples of use

1. DR 100 with Sample Divider PT 100
2. DR 100 with Sample Divider PK 1000
3. DR 100 with Ultra Centrifugal Mill ZM 100
4. DR 100 with Crystalsizer from RETSCH Technology



Overview

- strong drive for even material feed
- infinitely adjustable volume flow
- material bed level can be variably adjusted
- optional control via interface
- digital time setting
- compact control and feed unit
- easy cleaning of push-fit feed chute
- maintenance-free design to CE standard
- 2-year warranty

Performance data

	DR 100
Applications	feeding, conveying
Feed material	pourable bulk materials
Time display	digital, 1 - 99 min or continuous
Volume flow	0 - 5 l/min, infinitely adjustable

Technical data

Available chute widths	15 mm	40 mm	75 mm
Chute length	210 mm	210 mm	210 mm
Hopper volume	2.8 litres	2.8 litres	3.5 litres
Feed size	<2 mm	<6 mm	<12 mm
W x H x D	260 x 420 x 280 mm		
Net weight	approx. 10 kg		

Noise values (noise measuring according to DIN 45635-31-01-KL3)

Measuring conditions: Conveying material: silica sand; particle size <1 mm	
Emission value with regard to workplace	L _{pAeq} 36 dB(A)
Sound power level	L _{WA} 42 dB(A)

Technology of DR 100

The feed material passes through the hopper onto the vibrating chute. This is made to vibrate at 50 (or 60) Hz by two electromagnets. The volume flow can be infinitely adjusted. Using the hopper adjustment, the layer height can be set in accordance with product and need. The DR 100 can be driven externally via an interface; for

example, the volume flow can be adjusted automatically to the grinding capacity of the RETSCH ZM 100 Ultra Centrifugal Mill.

The compact, maintenance-free design means that the vibratory feeders can be integrated simply into many devices or laboratory installations.



Rapid Dryer TG 100

Rapid and gentle fluidized bed drying

The TG 100 is used in the quality control, sample preparation and R&D departments. Bulk materials, whether organic, inorganic, chemical, pharmaceutical, coarse, fine, crystalline, fibrous or leafy are **dried, loosened up and mixed without any localized overheating**. Even objects made of glass such as pipettes, ceramics, plastics, textiles, wood or metal such as test sieves can be dried efficiently. The drying temperature and air volume can be adjusted.

The standard accessories include a quick-action clamping lid with bayonet connection and a filter bag for attaching the 6 litre drying chamber which is available as an accessory. Test sieves with 200 mm dia. can be dried directly on the TG 100 without using the chamber. For 8" sieves (203 mm) an adapter is required.

The following accessories are available: 6 litre drying chamber, glass or stainless steel, with base made from Conidur stainless steel perforated plate with 63 µm holes.

The clamping lid with interchangeable filter achieves a particularly high degree of dust particle retention from the discharged air. This ensures a virtually loss-free recovery of the dry substance.

The attachment with 3 removable glass drying chambers (each 0.3 l) with filter hoses permits the simultaneous drying of three small samples of different materials under the same conditions. The bases are made of the same material as the larger chamber. Container lids with filter inserts are available as extra accessories.



Clamping lid with filter insert

Attachment with 3 drying chambers

Overview

- rapid and gentle drying even of temperature-sensitive substances
- the final product is loose, well blended, pourable
- versatile with a choice of drying chambers and exhaust air filters
- simple operation thanks to a quick-clamping cover with bayonet catch
- compact, space-saving design, satisfying CE requirements
- 2-year warranty

Performance data

TG 100

Applications	drying
Feed material	bulk materials and solids, >63 µm
Temperature control	continuously adj., 40 - 120 °C (dependent on air throughput rate)
Time setting	continuously adjustable, 0 - 60 min
Drying time	5 - 20 min, depending on product, quantity, moisture content
Container volume	1 x 6 litres or 3 x 0.3 litres

Technical data

TG 100

W x H x D	300 x 970 x 460 mm
Net weight	approx. 20 kg

Noise values (noise measuring according to DIN 45635-31-01-KL3)

Measuring conditions: Dried product: Artificial fertilizer, 3 to 7 mm	
Emission value with regard to workplace	L _{pAeq} 72 dB(A)
Sound power level	L _{WA} 79 dB(A)

Technology of TG 100

Drying in the rapid dryer makes use of the fluidized bed process, a technique similar to the one used in large industrial dryers. Ambient air is drawn in through a filter. A blower moves the air around the motor and across heating elements, and ultimately forces it through the perforated plate and into the detachable drying container.

The solid particles are blown upward and agitated and thus kept separate one from another so that their sur-

faces cannot stick together - an annoying problem in other processes. The air stream extracts moisture from the particles and then exits through the filter bag in the cover of the drying container. Using the quick-clamp cover with the filter fleece insert is advisable when dealing with product finer than 100 µm in diameter.

The 750 watt blower provides air at a rate of 50 to 100 m³/h; heater output is 2000 watts. The air volume, heating power and temperature are infinitely adjustable. Temperature



control (40 to 120 °C) is effected using the display gauge.

Ultrasonic Baths

UR 1 / UR 2 / UR 3



UR 1

Cleaning

The RETSCH ultrasonic bath cleans test sieves, microprecision sieves, glass and metal components as well as metallurgical and geological samples, spectacles, jewellery or coins gently and intensively. In addition to cleaning, the ultrasonic cleaning unit can also be used for other working processes.

Overview

- fast, gentle, and highly efficient cleaning
- universal and compact
- easy to use, saves time and cost
- intensive homogenisation, dispersion and degassing
- low-maintenance, long life and environmentally sound
- 2-year warranty

Homogenisation

The RETSCH ultrasonic bath is used to prepare suspension samples for wet screening or sedimentation analysis in connection with particle size analysis. Agglomerates are desagglomerated and dispersed in the solution.

Dispersion

The RETSCH ultrasonic bath is used in chromatography to disperse packing material in the slurry and thus obtain reproducible separation materials.



UR 3

Degassing

The RETSCH ultrasonic bath is also suitable for degassing solutions or emulsifying oil and aqueous phases.

Performance data	UR 1	UR 2	UR 3
Applications	cleaning, homogenisation, dispersion, degassing		
Feed material	sieves, glass and metal components, suspensions		
Oscillating tank			
Ø x H / W x H x D	245 x 130 mm	520 x 200 mm	500 x 300 x 300 mm
Volumes	5.7 litres	42.0 litres	45.0 litres
Time setting	1 - 15 min or continuous		
HF continuous maximum output	2 x 240 W	2 x 600 W	2 x 1000 W
Technical data	UR 1	UR 2	UR 3
Ø x H / W x H x D	260 x 260 mm	570 x 460 mm	540 x 500 x 340 mm
Net weight	approx. 5 kg	approx. 21 kg	approx. 27.5 kg
Noise values (DIN EN 61012)			
Noise values	61.5 dB(AU)	76.5 dB(AU)	70.0 dB(AU)

Technology of UR 1/2/3

A high-frequency generator produces about 35000 oscillations per second, which are transferred into the cleaning solution and cause it to resonate. The energy density of the sound field is so high that a cavitation effect sets in. Innumerable extremely small vacuum bubbles develop, which collapse in microseconds due to pressure and suction, in other words they implode. The pulses triggered by this remove dirt particles even at the deepest, least accessible places or they re-

sult in homogenisation, dispersion and degassing. The compact housings and the oscillating tanks are made of stainless steel. Through the ball valve drain located on the casing the cleaning solution can be conveniently and safely drained off. In combination with the splash-proof version, a high degree of operational safety is provided. Below the oscillating tank is fitted a powerful high frequency generator. The broad-beam oscillation system with PZT oscillators



vibrates the solvent bath at optimum frequency so as to produce an outstanding cleaning effect.

Order data DR 100, TG 100, UR 1/2/3

Vibratory Feeder DR 100				Item-No.
DR 100 drive unit (please order feeding kit separately)				
DR 100 drive unit for 220-240 V, 50 Hz				70.937.0003
DR 100 drive unit for 110-120 V, 60 Hz				70.937.0012
DR 100 complete units, including drive unit, feeding kit with push-fit feed chute 40 mm, hopper and clamping fixture				
DR 100 complete unit for 220-240 V, 50 Hz				70.937.0054
DR 100 complete unit for 110-120 V, 60 Hz				70.937.0055
Feeding kits, consisting of push-fit chute complete with holder, hopper and standard fixing (for models from 11/1999)				
Feeding kit with push-fit feed chute	chute width 15 mm:	72.020.0001	40 mm: 72.020.0002	75 mm: 72.020.0003
Accessories for DR 100				
Push-fit feed chute of stainless steel, with holder (also for upgrading feeder DR 1000)				
	chute width 15 mm:	72.729.0005	40 mm: 72.729.0006	75 mm: 72.729.0007
Push-fit feed chute of stainless steel, without holder				
	chute width 15 mm:	03.729.0035	40 mm: 03.729.0036	75 mm: 03.729.0037
Push-fit feed chute of aluminium, without holder				
	chute width 40 mm:	03.729.0051	75 mm: 03.729.0043	
Vibratory tube of stainless steel, 18 mm Ø, length 185 mm, with integrated holder				72.714.0001
Push-fit feed chute of stainless steel, 36 mm V-shape, with holder (also for upgrading)				72.729.0008
Push-fit feed chute of stainless steel, 36 mm V-shape, without holder, for holder 15/40				03.729.0039
Push-fit feed chute of stainless steel, width 40/75 mm, for holder 75 mm				03.729.0040
Feed hopper of stainless steel, for chutes 15/34 mm and 40 mm, hopper volume 2.8 litres				03.785.0135
Feed hopper of stainless steel, for chutes 75 mm, hopper volume 3.5 litres				02.785.0019
Rapid Dryer TG 100				Item-No.
Rapid Dryer TG 100 (complete with clamping lid and filter bag. Please order drying chamber separately)				
TG 100 for 230 V, 50 Hz				70.736.0001
TG 100 for 220 V, 60 Hz				70.736.0003
Accessories for TG 100				
Drying chamber of glass, 6 litres				72.783.0001
Drying chamber of stainless steel, 6 litres				72.783.0002
Quick-action clamping lid with filter insert (exchangeable), incl. 10 replacement filters				72.643.0013
Lid attachment with 3 drying chambers of glass, 0.3 litres each				72.002.0002
Cover with filter insert for 0.3 l drying chambers (3 pieces)				72.107.0001
Adapter for test sieves with 203 mm Ø				72.001.0005
Spare parts for TG 100				
Filter bag of nylon, for drying chamber 6 litres				02.186.0015
Drying chamber of glass, 0.3 litres				02.045.0010
Filter bag for drying chamber 0.3 litres				02.186.0016
Filter insert for quick-action clamping lid, 10 pieces				72.143.0001
Ultrasonic Baths UR 1 / UR 2 / UR 3				Item-No.
Ultrasonic Baths				
UR 1 for 230 V, 50/60 Hz,	oscillation tank: 24.5 cm Ø x 13.0 cm,	5.7 litres		70.791.0001
UR 1 for 110 V, 60 Hz,	oscillation tank: 24.5 cm Ø x 13.0 cm,	5.7 litres		70.791.0002
UR 2 for 230 V, 50 Hz,	oscillation tank: 52.0 cm Ø x 20.0 cm,	42.0 litres		70.791.0003
UR 2 for 110 V, 60 Hz,	oscillation tank: 52.0 cm Ø x 20.0 cm,	42.0 litres		70.791.0004
UR 3 for 220-240 V, 50/60 Hz,	oscillation tank: 50.0 x 30.0 x 30.0 cm,	45.0 litres		70.791.0005
UR 3 for 110-130 V, 50/60 Hz,	oscillation tank: 50.0 x 30.0 x 30.0 cm,	45.0 litres		70.791.0006
Accessories for ultrasonic baths				
Cover of stainless steel	for UR 1:	09.107.0249	UR 2: 09.107.0250	UR 3: 09.107.0395
Basket of stainless steel	for UR 1:	09.145.0001	UR 2: 09.145.0002	UR 3: 09.145.0003
Detergent TICKOPUR RW 77, 1 litre				05.620.0001



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