

## **RETSCHE Product Navigator**

### ■ Milling

### ■ Sieving

Analytical Sieve Shakers

– AS 200

– AS 300

– AS 400

Test Sieves

Software

– EasySieve®

### ■ Assisting

# Sieving for perfect quality control



## **Improve your analyses and products with RETSCH!**

Sieving analyses with RETSCH instruments produce exact and reproducible results, due to the unique technologies in the design of our test sieves and sieve shakers. Customized evaluation software, sample dividers and an extensive range of accessories complement our solutions in the field of analytical sieving. This is the reason why RETSCH meets and exceeds the high requirements of its customers.

# **Retsch®**

**Solutions in Milling & Sieving**

Sample dividers



Analytical sieve shakers



Test sieves



EasySieve® software



Cleaners and dryers



# Superiority lies in the details – Technology from RETSCH

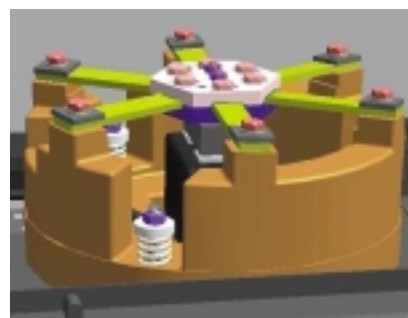
RETSCH products are used in the quality control of solids for a reason. From representative sample division to professional maintenance of the test sieves – RETSCH offers you a complete equipment range for optimal results:

- **Sample dividers**  
for producing representative partial samples
- **Analytical sieve shakers**  
High-tech devices in various sizes and types of motion of the product to be sieved (throwing movement with angular momentum, or horizontal circular motion), suitable for wet and dry sieving operations, can be calibrated
- **Test sieves**  
comply with standards, can be calibrated, produced according to state-of-the-art production technique
- **EasySieve® software**  
to control the sieve shaker, record weighing data and evaluate and document sieve analyses according to relevant rules and standards
- **Ultrasonic cleaners and dryers**  
for the optimal cleaning of test sieves and for the rapid, gentle drying of samples and test sieves

**Many unique details make RETSCH products stand out – for optimal results and maximum working efficiency. Convince yourself!**

## Superior drive mechanism

The core of each RETSCH projection sieve shaker is the electromagnetic drive. It produces an optimal throwing motion that moves the product to be sieved equally over the whole sieving surface. The drive can take a high stress load and is very effective, so that the sieving time is greatly reduced. Furthermore, this patented RETSCH technology runs without wear and does not require maintenance.



## Comfortable handling and efficient working

Clamping test sieves does not get any easier, faster and safer than with the clamping device "comfort". The trick: simply press the upper lever to clamp the sieves tight. After the sieving is completed, the sieve stack can be withdrawn without having to completely take off the lid. Thus, time and power are saved.

In the AS 300 control and the AS 400 control, 9 different parameter combinations can be saved in the sieve shaker. Thus, repetitive sieve analyses can be performed quickly and efficiently. Errors due to wrong parameter entries are prevented.

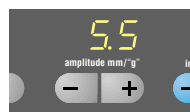




## Unique operation in accelerated mode



Vibration height  
in mm



Acceleration of the  
sieve in "g"

In RETSCH sieve shakers the vibration height cannot only be adjusted in mm, but also in the acceleration of the sieve, independent of the power frequency, in "g" ("g" = acceleration due to gravity, 9.81 m/s<sup>2</sup>). "Sieving with equal acceleration" means obtaining worldwide comparable and reproducible results, completely independent of operational parameters such as power frequency, load, age or condition of the machine. An advantage that only RETSCH sieve shakers offer.

## Calibration

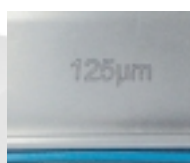
All RETSCH analytical sieve shakers of the series "control" and all RETSCH test sieves can be calibrated and thus may be used in quality control according to DIN EN ISO 9000 ff. RETSCH supplies high-quality products that you can rely on.

## Fit for the future



All RETSCH model "control" sieve shakers are equipped with a serial interface to allow for an automated workflow. Using the software EasySieve®, the sieve shaker can be operated from a PC and the whole sieving process can be monitored and documented, visible for you on the screen.

## High quality test sieves



Due to an optimised and highly modern production process, RETSCH offers you test sieves of unparalleled quality and precision. Thus, RETSCH meets and exceeds the highest requirements that are demanded today in particle size analyses. Better sieves guarantee better, exact results.

## Form follows function

RETSCH laboratory instruments also show their technical superiority from the outside. The modern and ergonomic design of the instruments expresses the many technical innovations that are incorporated in them. The AS 200 was already awarded a design prize.

## Why particle size analysis?

The knowledge of particle size and distribution in disperse solids is very important for research and development, production and quality assurance.

The following list shows product properties that depend on the particle size distribution:

- mechanical properties of bulk goods
- surface reaction
- insulating and absorbing properties
- flavour
- mixability
- wear resistance
- filtration ability
- stress and breaking behaviour
- agglomeration due to adhesive forces
- conductivity
- extinction

# AS 200 basic / digit / control



## Innovative technology that sets standards worldwide!

RETSCH analytical sieve shakers are used in research & development, quality control of raw materials, interim and finished products as well as in production monitoring. The three-stage series AS 200 enables each user to select the suitable instrument according to his individual requirements and budget. The AS 300 is designed for larger feed quantities. All "control" models are suitable as measuring instrument according to DIN EN ISO 9000 ff.

## AS 200 control



The AS 200 control complies with the highest requirements in quality assurance. One particular characteristic makes this RETSCH product stand out from others: Instead of the vibration height, also the **sieve acceleration independent of the power frequency** can be set. Thus, the AS 200 control ensures **comparable and reproducible sieving results worldwide**. It can be calibrated to ensure 100% reproducibility of sieving results, not only in one device, but among all AS 200 control units! Thus, the requirement for the **test materials monitoring according to DIN EN ISO 9000 ff** is met. Its microprocessor-controlled **measuring and control unit** ensures a constant vibration height. With regard to operational convenience, the AS 200 control meets and exceeds all standards of a modern laboratory. All sieving parameters – vibration height, time, interval – are set, displayed and monitored digitally. With the **integrated interface** and the supplied interface cable, the instrument can be connected to a PC and controlled with the evaluation software EasySieve®. This programme enables you to control the

whole sieving process and the subsequent documentation: with convenience and accuracy.

The AS 200 control is indispensable for all users who attach importance to precision and operational convenience and work according to the guidelines of the GLP.

All RETSCH sieve shakers can be combined with various sieve clamping units. For frequent sieving processes, we recommend the user-friendly quick clamping unit "comfort".

## AS 200 basic



The **economical alternative** of the series with familiar RETSCH quality and reliability. With analogue adjustment of vibration height and sieving time.

## AS 200 digit



The standard model of the AS 200 series is recommended whenever **digital time display, interval operation** and analogue adjustment along with optical monitoring of the vibration height are required.

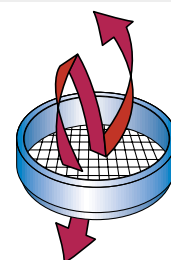
## Overview

- sieving with 3D effect
- for sieves up to 203 mm (8") Ø
- measuring range 20 µm to 25 mm
- available in 3 models
- easy operation, ergonomic design
- low noise and maintenance-free
- 2 years warranty, conforms with CE standards

## Technology of AS 200, AS 300

All sieve shakers of the series AS 200 and AS 300 work with an electromagnetic drive that is patented by RETSCH (EP 0642844). This drive produces a 3D throwing motion that moves the product to

be sieved equally over the whole sieving surface. The advantage: high stress capacity, extremely smooth operation and short sieving times with high separation efficiency.



# AS 300 control



## AS 300 control



The AS 300 control is particularly designed for test sieves with a diameter of 305 mm (12"). Compared to sieves with a diameter of 200 mm, a 2.25 times higher sieving surface is thus available. Therefore, the average sieving times can be greatly reduced with the AS 300 control. Another advantage is the very **high feed quantity** (up to 6 kg) that can be separated in one working run. Repetitive operations can be greatly simplified with the possibility to **store up to 9 parameter combinations** directly in the sieving instrument. For perfectly reproducible sieving results, the AS 300 control can be pro-

grammed with **sieve acceleration independent of the power frequency** instead of vibration height. All sieving parameters are set, displayed and monitored digitally. The microprocessor-controlled **measuring device** monitors and automatically readjusts the vibration height in case of changes of the load or the voltage. The AS 300 control **can be calibrated**, and it is thus suitable for test materials monitoring according to DIN EN ISO 9000 ff is met. As all instruments of the series "control", the AS 300 also has an **integrated interface**. Using the evaluation software EasySieve®, the instrument can be controlled and adjusted. With EasySieve®, all sieving parameters are displayed on screen before and during the sieving process.

The AS 300 control is the optimal instrument for quick sieving of larger product quantities. With regard to operational convenience, reproducibility and durability, the instrument meets all requirements in the field of quality control.

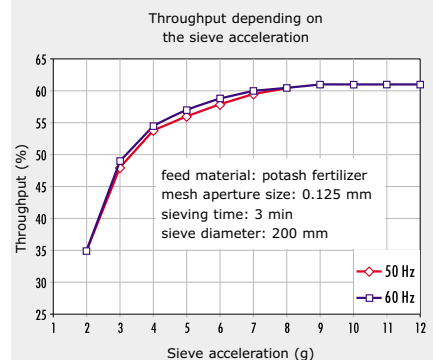
### Overview

- sieving with 3D effect
- for sieves with 305 mm (12") Ø
- measuring range 36 µm to 40 mm
- 9 parameter combinations can be stored
- short sieving times with large sieving surface and effective movement of the product to be sieved
- low noise and maintenance-free
- 2 years warranty, conforms with CE standards

## The worldwide unique RETSCH technology: sieving with controlled acceleration!

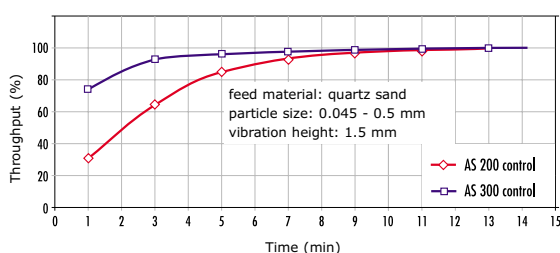
The sieve shaker AS 300 control is activated in its natural frequency. This means, the sieving frequency changes with the loading of the instrument. It depends on the weight of the sieve stack and the quantity of the loaded product to be sieved. The AS 200 control is activated in power frequency (50/60 Hz). In order to ensure the reproducibility of the results even in short-time sieving procedures, the default setting of the vibration height can be switched to **sieve acceleration** (sieving with equal acceleration). Thus, the instruments work completely **independent of** operational parameters such as **power frequency, loading, age, or condition** of the unit.

Therefore, the RETSCH sieve shakers AS 200 control and AS 300 control are the only sieve shakers to feature the possibility of eliminating influences of error by different sieving frequencies via automatic adjustment of the amplitude (**patents D 19 522 987, USA 5,791,494**). An amplitude of more than 2 mm can be achieved under all nominal load conditions, and the sieve acceleration achieved in this can be as high as 17 g ( $1 \text{ g} = 9.81 \text{ m/s}^2$ ).



The chart makes it clear: even with large differences in the frequency, sieving processes with equal acceleration always achieve fully coinciding results, independent of the sieving time. This is because the sieve acceleration is the decisive factor for the passage of the particles through the sieve.

Comparison AS 200 / AS 300 with high feed quantity



This chart exemplifies the average sieving times of an AS 200 control and an AS 300 control under equivalent circumstances.

# AS 400 control



## Sieving on one level

The RETSCH AS 400 control is used for the sieving of dry goods with test sieves of a diameter up to 400 mm. In this, the uniform, horizontal circular motion ensures exact separation of the product to be sieved. Fine and coarse-grained goods as found in the areas of milling, brewing, chemical industry, quarrying, soils, woodworking and plastics industry, can be exactly separated with the AS 400 control. The horizontal circular motion of the product to be sieved is particularly suitable for the separation of certain products, as milled grain, splints, and similar materials. For the testing of plastics (grainy moulding materials), the DIN 53 477 even requires the circular sieving motion.

## AS 400 control



The AS 400 control can be used as test instrument for the quality control according to DIN EN ISO 9000 ff. Due to the **controlled drive, which is independent of the power frequency**, the AS 400 control yields reproducible results worldwide. The desired number of revolutions / sieve acceleration and sieving time are set, displayed and monitored digitally. A test certificate is supplied with the instrument. The instrument can be **recalibrated**. If desired, the rotation direction can be set to alternate in the interval. Up to **9 sieving programmes** can be directly stored in the instrument and later recalled.

An integrated counter mass **ensures stability** even with a high mass of the sieve stack. The instrument can also be secured to the laboratory bench if desired. The base plate can take **very high loads** due to 4 eccentric guides. The AS 400 control has an **integrated interface** for controlling all sieving parameters via the EasySieve® software. The required interface cable is included in delivery.

The AS 400 control is a robust device, which meets highest requirements due to its superior technology. The possibility to clamp a wide range of test sieves with various diameters on the device ensures a **versatile use** of the AS 400 control.

For clamping the sieves, the proven and extremely convenient quick clamping device "comfort" is available. The sieve stack can be clamped with two simple steps.

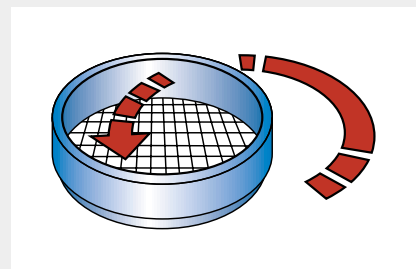
## Overview

- sieving with circular sieving motion according to DIN 53477
- for sieves up to 400 mm Ø
- measuring range 45 µm to 63 mm
- easy operation, ergonomic design
- low noise and maintenance-free
- 2 years warranty, conforms with CE standards

## Technology of the AS 400

The base plate performs horizontal circular motions with a radius of 15 mm (according to DIN 53477). The speed of 50 to 300 rpm is electronically controlled. It is continuously adjustable to meet the requirements of the product to be

sieved. The actual value of the number of revolutions is digitally displayed. The base plate is driven by a robust, maintenance-free drive motor with a power of 125 Watt. The power is transmitted via an eccentric.



# Overview of RETSCH sieve shakers

Performance data	AS 200 basic	AS 200 digit	AS 200 control	AS 300 control	AS 400 control
Applications	separation, fractioning, particle size determination				
Feed material	powders, bulk materials, suspensions		powders, bulk materials		powders, bulk materials
Measuring range*	20 µm to 25 mm		36 µm to 40 mm		45 µm to 63 mm
Max. batch / feed capacity	3 kg		6 kg		5 kg
Max. number of fractions**	9 / 17		9		7 / 9 / 17
Max. mass of sieve stack	4 kg		10 kg		15 kg
Adjustment of sieving parameters					
Amplitude / rpm (AS 400)	analogue	analogue	digital	digital	digital
Adjustment range	0 - 3 mm	0.2 - 3 mm	0.2 - 3 mm	0.2 - >2 mm	50 - 300 rpm
Sieve acceleration	-	-	1.0 - 15.1 g	1.0 - >10.0 g	0.04 - 1.51 g
Time display	analogue	digital	digital	digital	digital
Adjustment range	1 - 60 min	1 - 99 min	1 - 99 min	1 - 99 min	1 - 99 min
Interval operation	-	yes	yes	yes	yes
Adjustment range	-	10 s (fixed)	1 - 99 s	1 - 99 s	1 - 10 min
Vibration height / rpm (AS 400)	manual	manual	controlled	controlled	controlled
Parameter combinations that can be stored	-	-	-	up to 9 programmes	up to 9 programmes
Motion of product to be sieved	throwing motion with angular momentum			as AS 200	horizontal circular motion
Suitable for sieving of dry products	yes	yes	yes	yes	yes
Suitable for sieving of wet products	yes	yes	yes	-	-
Serial interface	-	-	yes	yes	yes
Including test certificate / can be calibrated	-	-	yes	yes	yes
* depending on feed material and used sieve set ** depending on the used sieve sizes					
<b>Technical data</b>					
Suitable sieve diameters	100 mm / 150 mm / 200 mm / 203 mm (8")			305 mm (12")	100 mm / 150 mm / 200 mm / 203 mm (8") / 305 mm (12") / 400 mm
Height of sieve stack	up to approx. 450 mm			up to approx. 450 mm	up to approx. 450 mm
W x H x D	400 x 230 x 350 mm			400 x 235 x 400 mm	540 x 260 x 507 mm
Net weight	approx. 30 kg			approx. 35 kg	approx. 73 kg
<b>Noise values (noise measuring according to DIN 45635-31-01-KL3)</b>					
Measuring conditions: 5 test sieves; vibration height 1.5 mm; feed material quartz sand; particle size <1 mm					
Emission value with regard to workplace	L <sub>pAeq</sub> 63 dB(A)		L <sub>pAeq</sub> 59 dB(A)		L <sub>pAeq</sub> 58.4 dB(A)

## Sieve clamping devices



Sieve clamping device "comfort"



Sieve clamping device "standard"



Sieve clamping device "economy"



Universal wet sieve clamping device "comfort"



Universal sieve clamping device "standard"

For all RETSCH sieve shakers, various sieve clamping devices are available, with which the sieves can be clamped safely, quickly and conveniently. The rapid clamping devices "comfort" are particularly user-friendly and time-efficient. With universal sieve clamping devices, test sieves of a diameter of 100 – 203 mm (8") can be clamped. As an option, they are also available for the sieving of wet materials.

Clamping cover	Clamping elements	Stand rod	Dry sieving	Wet sieving	Acrylic plastic window
<b>Sieve clamping device for AS 200 and AS 400</b>					
comfort	quick clamping elements	smooth	yes	no	approx. 150 / 300 mm
standard	quick clamping nuts	threaded	yes	no	approx. 150 / 300 mm
economy	quick clamping nuts	threaded	yes	no	none
<b>Universal sieve clamping device for AS 200 and AS 400</b>					
comfort	quick clamping elements	smooth	yes	optional	approx. 90 mm
standard	quick clamping nuts	threaded	yes	optional	approx. 90 mm
<b>Sieve clamping device for AS 300</b>					
standard	quick clamping nuts	threaded	yes	no	approx. 150 mm

# A new generation of RETSCH test sieves



- Production process:*
1. Entering Information
  2. Welding
  3. Lasering
  4. 100% Inspection

## Highly Modern Manufacturing Process

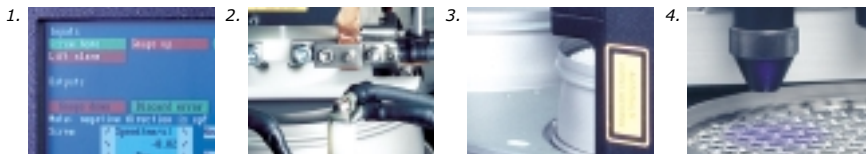
The demands made of particle size analysis are constantly increasing. This is also reflected in the greater requirements made in the new standard ISO 3310.

In order to adapt our test sieves to these new requirements, RETSCH has developed a completely new manufacturing process that guarantees a previously unattained quality and consistency in sieve production. In addition, a logistic manufacturing system makes it possible to record each and every material used in the process.

## Precision and Compatibility

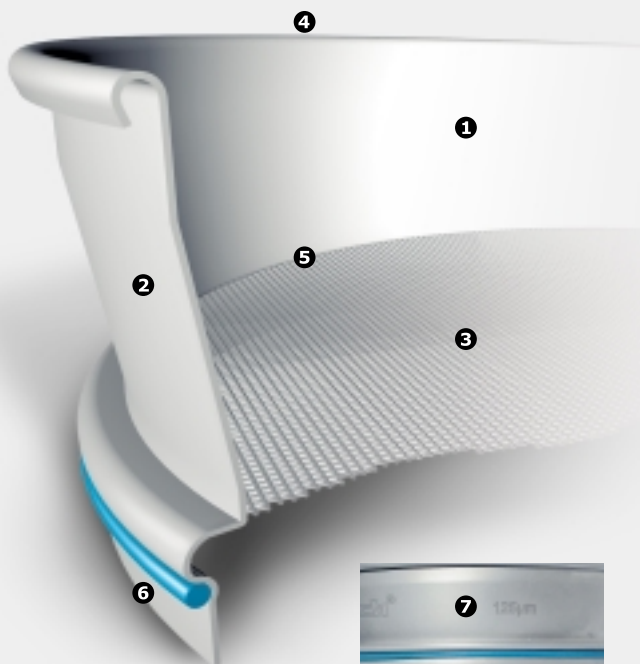
The new sieves are fully compatible with RETSCH's existing products and can be combined with other sieves without any problems. Beyond this, there's something important for you: each and every sieve that leaves our company includes a test report or, at your request, a special inspection certificate in conformity with ISO 3310-1. RETSCH's calibration certificates even ensure a higher statistical reliability and document our continual quest for perfection.

Retsch's new sieves are available in three sizes which have been determined to be the most commonly used **200 x 50 mm, 200 x 25 mm and 203 x 50 mm (8"x 2")**. Of course, we guarantee compatibility with other standard sieves.



## Seven Unique Benefits

Our new manufacturing process ensures an optimum design with each and every sieve. Experience yourself the benefits of increased quality analyses as well as improved handling and service life of the sieves.



1. One piece construction and fabric-transition without any grooves to prevent cross contamination (no solder, no residues, etc.)
2. A high degree of corrosion resistance and ease of cleaning due to high-alloy stainless steel (specifications: 316L or 1.4435)
3. 15% lighter than traditional sieves while at the same time increasing the free sieve area
4. Previously unattained product quality due to fully automatic production and extensive optical inspection with optimum design
5. Innovative resistance welding technology guarantees permanently tight sieve fabric
6. Maximum stability and optimum sealing when used in sieve stacks
7. Clear and precise labelling of the sieves with full traceability based on individualised laser engraving

# Maximum precision for exact results

## Test sieves with Ø of 100/150/305(12" )/400 mm

- sieve meshes, frames and labelling comply with standards
- tested 5 times, with test report
- according to ISO, ASTM, BS
- individual inspection certificate for test materials monitoring according to ISO 9000 ff available on request
- stainless steel wire sieve mesh, 20 µm to 125 mm
- also available with perforated plate, round or square



## Sieve accessories

For the various test sieves, suitable collecting pans, collecting pans with outlet, intermediate pans, intermediate rims and sieve covers are available. Sieving aids and sieve racks complete the range of accessories.

Please refer to our price list for exact order data of the test sieves and the available accessories.



1. collecting pan and intermediate rim
2. sieve cover
3. collecting pan with outlet
4. sieve rack

## A Comparison of European and American Sieve Standards

ISO	ASTM	ISO	ASTM
[µm]	[#]	[mm]	[#]
20	635	1,00	18
25	500	1,12	
32	450	1,18	16
36		1,25	
38	400	1,40	14
40		1,60	
45	325	1,70	12
50		1,80	
53	270	2,00	10
56		2,24	
63	230	2,36	8
71		2,50	
75	200	2,80	7
80		3,15	
90	170	3,35	6
100		3,55	
106	140	4,00	5
112		4,50	
125	120	4,75	4
140		5,00	
150	100	5,60	3.1/2
160		6,30	1/4 in.*
180	80	6,70	0.265 in.
200		7,10	
212	70	8,00	5/16 in.
224		9,00	
250	60	9,50	3/8 in.
280		10,00	
300	50	11,20	7/16 in.
315		12,50	1/2 in.*
355	45	13,20	0.530 in.
400		14,00	
425	40	16,00	5/8 in.
450			
500	35		
560			
600	30		
630			
710	25		
800			
850	20		
900			

\* ASTM supplementary values

## Tested quality – with certificates

### RETSCH certificates

Prior to delivery, each sieve is optimally measured and granted a **test report**.

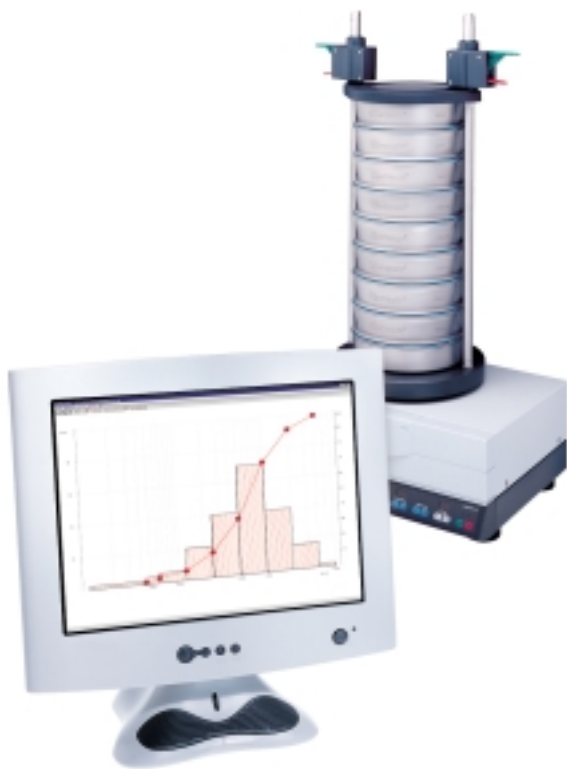
On request, a **inspection certificate** with the measuring results in tabular and graphical form or a calibration certificate with detailed statistics is delivered with the acceptance **calibration certificate**.

### Calibration service

As a special service, we offer you to recalibrate your test sieves. After the standard measuring process, all relevant data are recorded and confirmed in the **calibration certificate** after the standard measurement, if desired.



# Control, evaluation, documentation with EasySieve®



## Simple, fast, and reliable

EasySieve®, the software for particle size analyses, exceeds manual evaluation in many aspects, due to the fact that the software is able to automatically perform the necessary measurement and weighing procedures – from the registration of the weight of the sieve up to the evaluation of the data. It is more simple and more comfortable to use than ever before, and, to put it simply, “easy”.

Due to the logical design of the software it is easier for the user to get started with the program. The program leads the user through the process step by step. Moreover, the abundance of evaluation possibilities allows for absolute flexibility with regard to adjustment to demanding and individual tasks.

## An example of a particle size analysis using EasySieve®

### 1. Parameter entry

All available parameters (such as sieve stack configuration, dead weight of the sieve, sieve shaker settings) as well as the characteristics, which may have to be calculated, can be entered by clicking with the mouse in the corresponding fields. Routine parameters can be entered, edited, saved and recalled at a later time. Product specific settings of the measurement parameters are saved and ensure a productive workflow.

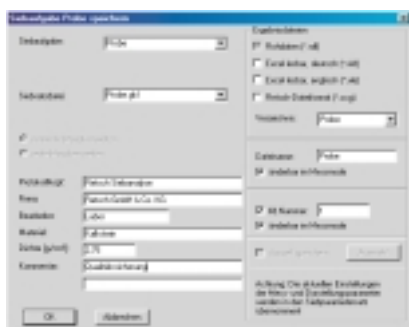
### 2. Sieve analysis

The program accepts automatic and manual data entries from both scale and sieve system. All RETSCH sieve shakers of the series “control” can be automatically controlled with EasySieve®.

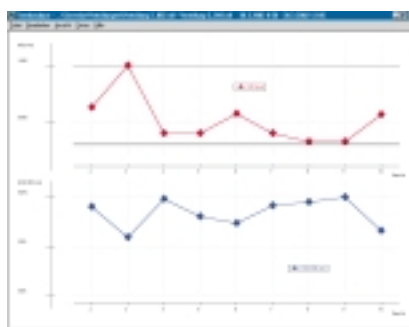
After the sieve analysis is completed, the loaded sieves are reweighed. By determining the weight difference, the program automatically detects the mass proportions and assigns them accordingly to the corresponding fractions. All data are immediately available for further processing.

### 3. Evaluation

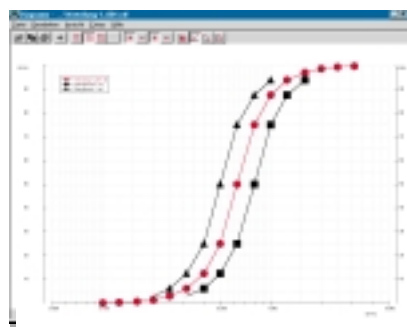
The EasySieve® software calculates all common particle distributions as well as the characteristic values of the particle size, thus making it possible to present the results in standard presentation forms, such as tables and charts. Cumulative throughput or residual values, distribution density and histograms can be included in the standard particle size distributions. In addition to this, the program allows for a trend analysis of production procedures, averaging and much more. Last but not least, fineness and distribution characteristics as well as standard parameters can be selected.



Parameter entry



Trend analysis of production procedures



Comparison with specification limits



# Professional particle size analyses

## EasySieve® Standard or EasySieve® Comfort

Two different versions of EasySieve® are available: Standard and Comfort. EasySieve® Comfort offers enhanced possibilities for data transfer to LIMS systems, for graphical display of trend analyses as well as for the determination of special characteristics. Available in German and in English.

### 4. Data export

All measured data can be printed, saved and exported as tables and charts. Furthermore, the data be processed using other software applications such as Excel, Word, PowerPoint and Acrobat Reader, or be exported as ASCII files. Automatic transfer into the LIMS system is possible with EasySieve® Comfort. Data import and export for modern optical particle size analysers such as the CAMSIZER® or CRYSTALIZER® from Retsch Technology is quick and easy.

### Overview

- automatic registration, evaluation and administration of measurement data
- logical design, self-explanatory
- measurement protocol in accordance with standards
- complex transformation into charts and tables
- data link of different measurement instruments
- automatic detection and configuration of common analytical scales
- comprehensive data export
- comprehensive help text, detailed manual

### System requirements

- Pentium PC, Windows® 95,98,NT, WIN 2000, XP, free serial interface
- for automatic control:
  - scale with serial interface
  - sieve shaker with serial interface (e.g. AS 200 control, AS 300 control, AS 400 control)

Feature	Comfort	Standard
<b>General information</b>		
Windows®, interface	Windows® 95, 98, NT, WIN 2000, XP (others on request)	Windows® 95, 98, NT, WIN 2000, XP (others on request)
ASTM and Tyler Mesh	x	-
Password protection for sieve analysis	x	x
Serial no. for sieves	x	-
Sieve analysis with		
• nominal mesh size	x	x
• actual mesh size	x	-
Automatic simultaneous data transfer	x	-
Administration of measurement data	unlimited	unlimited
Data import and export	x	x
CD manual / online help	x	x
Measurement protocol (according to DIN 66 165)	x	x
<b>Tables</b>		
Throughput values Q3 (x)	x	x
Residual values (1-Q3(x))	x	x
Fraction p3	x	x
Fraction Δm (proportional masses)	x	x
Distribution density q3(x)	x	x
log. distribution density q3*(x)	x	x
Actual mesh size	x	-
<b>Diagram</b>		
combined representation of several analyses	x	x
Curve representation	x	x
Distribution density		
• x-axis	lin, log	lin, log
• y-axis	lin, log, RRSB	lin, log, RRSB
Windowing (Zoom)	x	x
Cumulative curve (throughput) Q3 (x)	x	x
Residual curve (1-Q3 (x))	x	x
Fraction p3/histogram	x	x
Lin. Division density q3(x)	x	x
Log. Division density q3*(x)	x	x
Trend analysis	x	-
Limit value graph with specifications limits	x	x
2 representation possibilities (including right y-axis)	x	x
Reference particles (registration of external particle size division)	x	x
<b>Parameters</b>		
Fineness parameters, 3 values Q3 (x)	x	x
Quantile particle size, 3 values x (Q3)	x	x
RRSN parameters	x	x
Sauter mean diameter X St	x	-
Splinter value	x	x
Specific interface		
• volume related Sv	x	-
• mass related Sm	x	-
Unequal grade of granularity	x	x
AFS particle fineness No.	x	-

## Order data

Analytical sieve shaker AS 200			Item No.	
AS 200 (not including clamping device, test sieves and collecting pan)		basic	digit	control
AS 200	230 V, 50 Hz	30.016.0001	30.015.0001	30.017.0001
AS 200	110 V, 60 Hz	30.016.0004	30.015.0004	30.017.0004
AS 200	120 V, 60 Hz	30.016.0005	30.015.0005	30.017.0005
Clamping devices, complete for AS 200				
economy	for test sieves 100/150/200/203 mm (8") Ø		32.662.0003	
standard	for test sieves 200/203 mm (8") Ø		32.662.0002	
comfort	for test sieves 200/203 mm (8") Ø		32.662.0001	
Universal clamping devices, complete for AS 200				
			wet sieving	dry sieving
standard	for test sieves 100/150/200/203 mm (8") Ø		32.662.0007	32.662.0005
comfort	for test sieves 100/150/200/203 mm (8") Ø		32.662.0006	32.662.0004
Accessories for AS 200				
Sieve stack, 200 mm Ø, 50 mm height, consisting of 8 test sieves acc. to ISO 3310/1 (45 µm, 63 µm, 125 µm, 250 µm, 500 µm, 1 mm, 2 mm, 4 mm) and collecting pan			60.131.000999	
Sieve stack, 203 mm (8") Ø, 50 mm height, consisting of 8 test sieves acc. to ASTM (325 mesh, 230 mesh, 120 mesh, 60 mesh, 35 mesh, 18 mesh, 10 mesh, 5 mesh) and collecting pan			60.150.000999	
Test sieve rack for 10 test sieves 200/203 mm (8") Ø			32.012.0001	
Add-on weight 2100 g (two discs) for low loads			02.938.0001	
Analytical sieve shaker AS 300			Item No.	
AS 300 (not including clamping device, test sieves and collecting pan)		control		
AS 300	100-240 V, 50-60 Hz	30.020.0001		
Clamping devices, complete for AS 300				
standard	for test sieves 305 mm (12") Ø		32.662.0008	
Accessories for AS 300				
Sieve stack, 305 mm (12") Ø, 50 mm height, consisting of 7 test sieves acc. to ISO 3310/1 (0.63 mm, 1.25 mm, 2.5 mm, 5 mm, 10 mm, 20 mm, 31.5 mm) and collecting pan			60.158.000999	
Sieve stack, 305 mm (12") Ø, 50 mm height, consisting of 7 test sieves acc. to ASTM (30 mesh, 16 mesh, 8 mesh, 4 mesh, 3/8", 3/4", 1 1/4") and collecting pan			60.159.000999	
Analytical sieve shaker AS 400			Item No.	
AS 400 (not including clamping device, test sieves and collecting pan)		control		
AS 400	100-240 V, 50-60 Hz	30.022.0001		
Clamping devices, complete for AS 400				
standard	for test sieves 400 mm Ø		32.662.0010	
comfort	for test sieves 400 mm Ø		32.662.0011	
All clamping devices of AS 200 and AS 300 are also suitable for AS 400				
Accessories for AS 400				
Sieve stack, 400 mm Ø, 65 mm height, consisting of 6 test sieves acc. to DIN 3310/1 (0.5 mm, 1 mm, 2 mm, 5 mm, 10 mm, 20 mm) and collecting pan			60.166.000999	
Sieve stack, 400 mm Ø, 65 mm height, consisting of 6 test sieves acc. to ASTM (35 mesh, 18 mesh, 10 mesh, 4 mesh, 3/8", 3/4") and collecting pan			60.167.000999	
Software EasySieve®			Item No.	
		German	English	
EasySieve® Standard, single-user-licence		32.645.0019	32.645.0020	
EasySieve® Comfort, single-user-licence		32.645.0021	32.645.0026	

For additional accessories as test sieves, sieve covers, collecting pans, sieving aids etc. please refer to our price list.  
For more details on our sample dividers, rapid dryers and ultrasonic cleaning baths see our "Assisting" brochure.

# Retsch®

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RETSCH – Your specialist for sample preparation offers you a comprehensive range of equipment. Please request information on our crushers, mills, sample dividers, feeders as well as cleaning and drying machines.