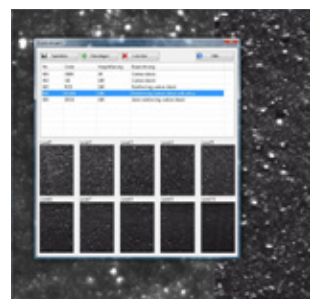
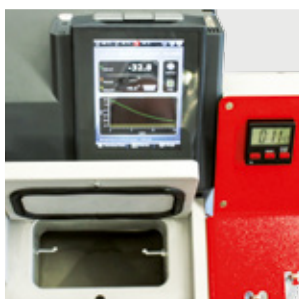
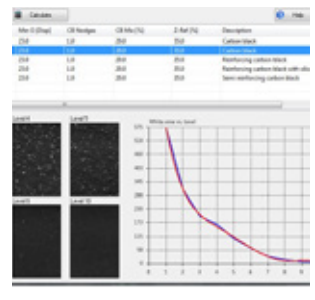
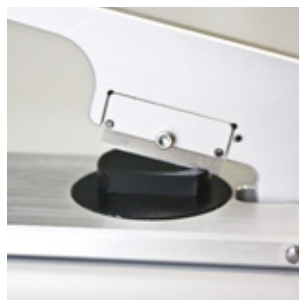
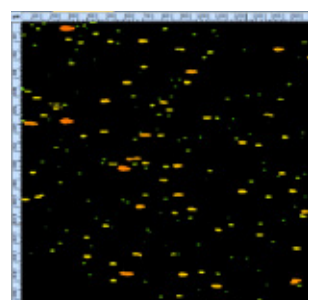
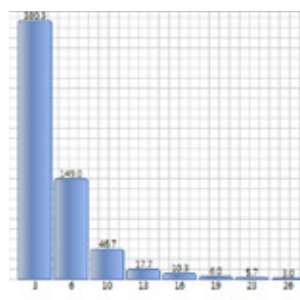


Dispersion



...Innovative testing solutions made in Germany!



MonTech Disper Tester 3000

Carbon black dispersion tester

Computer aided, advanced digital reflected light microscopy brought to the next level

The DisperTester 3000

is the most easy to use instrument for filler dispersion analysis; providing superior compliance, reproducibility and repeatability. The DisperTester provides accurate, repeatable results in seconds for both vulcanized and uncured rubber compounds that are applicable to the process, allowing quick and easy testing of dispersion compared to other optical techniques which often take hours to perform (less than 2 minutes with sample preparation).

The DisperTester 3000 is equipped with cutting edge digital image processing to automatically determine dispersion ratings, filler distributions and agglomerate sizes. Up to 5 individual readings can be taken in order to precisely evaluate the dispersion and detect possible variations along the surface of the sample.

To increase testing possibilities even further, the MonDispersion software features variable brightness, contrast and exposure, as well as focus control for every type of test material, allowing colored or even white samples to be tested.

The DisperTester 3000 system includes built-in reference scales and can be used for all filler types including Carbon Black, Silica and natural inorganic materials with fully automatic calculation of X value, Y value, Z %, Dispersion %, White area %, ... in accordance with international standards. All data is processed automatically by the MonDispersion software. Agglomerates are automatically highlighted and can even be manually measured by their diameter and normalized area. Test results are stored in an SQL database. PDF reports along with distribution spreadsheets and histograms are created and images are stored into an image database in a high-resolution JPEG format. Of course custom reference scales can be easily added by the user at any time.

The determination of filler dispersion in technical rubber goods and tire compounds is of great importance to the industry.

Dispersion quality has a direct impact on final product properties and is therefore widely used as a quality control parameter.

Many important properties of the cured compound are directly affected by filler dispersion including:

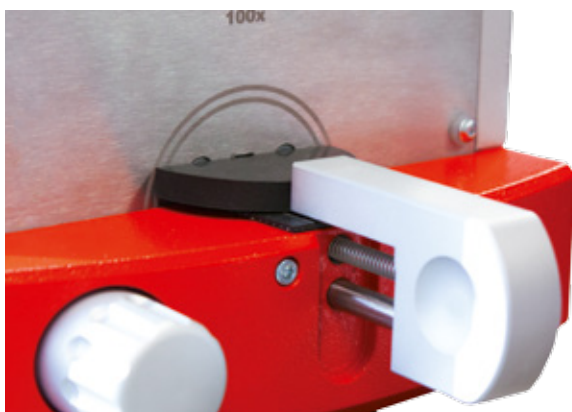
- Tensile strength
- Tear strength
- Fatigue resistance
- Abrasion resistance

The DisperTester 3000 is the only instrument that gives a direct measurement of dispersion in a fast and simple test, without requiring subjective assessment. The instrument is available in three models with different magnification levels:

- **30x** with an optical range of **10 to 191 µm**
- **100x** for particles from **1 to 58 µm**
- **1000x** is specially designed for micro agglomeration measurement of silica compounds for particles from **100nm to 3µm**

Sample Preparation

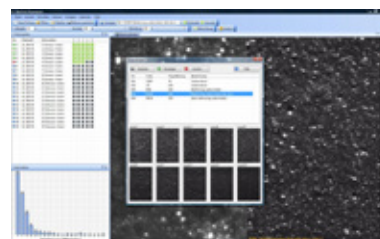
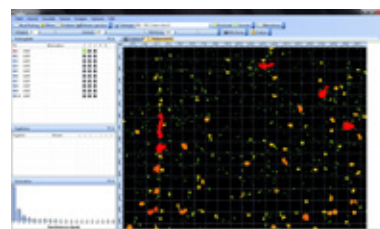
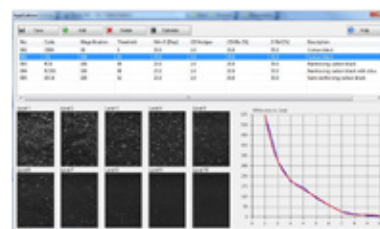
Sample preparation simply involves cutting the sample to generate a "fresh face / gloss cut" for analysis. A simple cutter utilizing ultra-sharp razor blades is supplied to optimize sample preparation for cured samples. For further simplifying sample preparation, the DisperCut automatic sample cutter is optionally available.



Technical specification

| | |
|--------------------------------|--|
| International standards | ISO 11345 : 2006, ASTM D 7723 |
| Electrical Requirements | 80 - 250 VAC, 47 – 63 Hz, 1 Amps |
| Data Interface | USB |
| Dimensions | Height: 190 mm Width: 160 mm Depth: 460 mm |
| Weight | 17.5 kg (net) |
| Magnification | DisperTester 3000 - 1000x = 1000 times magnification DisperTester 3000 - 100x = 100 times magnification DisperTester 3000 - 30x = 30 times magnification |
| Aperture Size | DisperTester 3000 - 1000x = 4 mm x 3.5 mm DisperTester 3000 - 100x = 4 mm x 3.5 mm DisperTester 3000 - 30x = 9 mm x 5 mm |
| Image resolution | 5 Megapixel with Carl Zeiss telecentric optics |
| Data format | PDF, JPEG, ASCII |

MonDispersion software



MonTech DisperTester 3000 Plus Carbon black dispersion tester

The MonTech DisperTester 3000 Plus

is the newest model of carbon black dispersion tester – computer aided, advanced digital reflected light microscopy brought to the next level. The DisperTester 3000 Plus is the most advanced instrument for reliable filler dispersion analysis based on the superior compliance, reproducibility and repeatability well known from the DisperTester 3000 series.

In addition, the DisperTester 3000 Plus has been upgraded with a set of extensive new features for reliable, subjective and operator independent analysis of the mix quality of your rubber compounds:

- Rugged housing machined from a single block of high-strength aluminium
- 10 Megapixel camera with USB 3.0 connectivity
- Multi-direction variably controlled LED light sources
- Precisely guided, horizontally moving camera system to obtain multiple test points from a single sample placement
- Fully automated or manual focusing, scanning and evaluation
- Black and White and Color camera systems available for black, white and colored rubber compounds
- Integrated data acquisition and analysis featuring PDF reports, histograms and high resolution result images
- Optional autosampling systems for 50 or 100 samples

The DisperTester 3000 Plus features a totally new precision optical system paired with latest digital image processing technology. These enhanced capabilities now allow Dispersion analyses for particles from 1 μm to 250 μm - in full compliance with latest ISO 11345 and ASTM D 7725. Imaging capabilities are further extended with variable image thresholds and settings for advanced image and particle analyses.

The DisperTester 3000 plus features a precision double stage linear drive system to precisely evaluate variations along the surface of the sample. This totally eliminates the need for manual sample placement by allowing up to 5 individual readings for each sample placement.

To increase testing possibilities even further, the MonDispersion software now features additional imaging techniques such as variable focus control, freely definable shutters and image filters. This ensures an even clearer, superior quality sample image; providing higher test result precision and improved reproducibility.

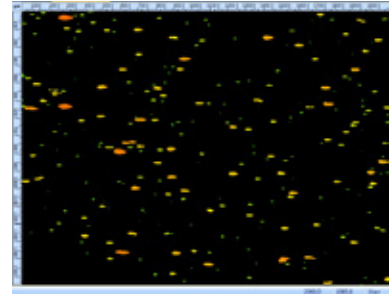
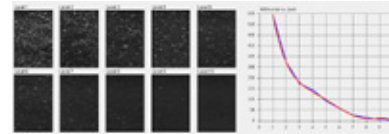
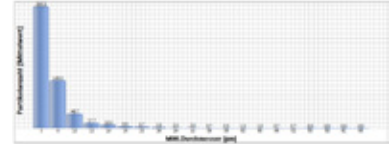
The DisperTester 3000 plus system includes additional built-in reference scales and can of course be used for all filler types including Carbon Black, Silica and natural inorganic materials with fully automatic calculation of X value, Y value, Z %, Dispersion %, White area %, ... for the most precise filler dispersion analysis.



Technical specification

| | |
|--------------------------------|--|
| International standards | ISO 11345 : 2006, ASTM D 7723 |
| Electrical Requirements | 80 - 250 VAC, 47 – 63 Hz, 1 Amps |
| Data Interface | USB 3.0 |
| Dimensions | Height: 180 mm Width: 220 mm Depth: 375 mm |
| Weight | 24 kg (net) |
| Magnification | 100 times magnification |
| Aperture Size | 12 mm x 3.5 mm |
| Agglomerate range | 1 μ m to 250 μ m |
| Focus | Fully automatic or manual |
| Image resolution | 10 Megapixel with Carl Zeiss telecentric optics |
| Data format | PDF, JPEG, ASCII |

MonDispersion software



MonTech DisperCut 3000

Stretched sample cutter for Dispersion testing



DisperCut 3000

The DisperCut 3000 is a small and easy to use tabletop sample cutter that produces fine cuts of cured and uncured rubber samples especially for Dispersion testing samples.

The cutter is equipped with a high-speed close and cut system with simultaneous sample pre-stretching to avoid smearing of the sample and guaranteeing the best straight and clean cutting results.

Test samples can be cut and prepared within a single second! This makes the patented DisperCut 3000 sample cutter the most reliable tool for producing repeatable samples for Dispersion testing by excluding all kinds of operator influences.

Integrated endstops make sample positioning fast, reliable and easy, ensuring similar test sample dimensions.

The precision-ground blade guides, combined with ultra sharp, heavy-duty single edge blades, ensure straight and precise cuts.

In combination with the DisperCool 3000 chiller unit, the DisperCut 3000 cannot only be used for cured rubber samples, but is also the ideal combination for preparing uncured rubber samples by first cooling them down to glass transition temperature in the DisperCool 3000 and then cutting the samples with the DisperCut 3000.

The cutter is equipped with a two-hand safety control system for simple operation and the highest possible operator safety, eliminating the risks associated with manually operated sample cutters. The cutting knife is always covered and protected to avoid any accidental cutting or touching of the blade.

Technical specification

| | |
|--------------------------------|---|
| International standards | ISO 11345 : 2006, ASTM D 7723 |
| Cutting blades | Ultra-sharp heavy duty single edge blades, easily replaceable |
| Sample dimensions | Max. Ø 45 mm or 40 x 40 mm |
| Pre-stretching | adjustable by different cutting plates from 5 to 10% |
| Operation | 2-hand safety control with anti-tiedown |
| Cutting speed | Up to 20 cuts per minute |
| Dimensions | Height: 430 mm Width: 295 mm Depth: 205 mm |
| Weight | 12.0 kg (net) |
| Pneumatics | min. 5 Bar |

DisperCut - Step by Step



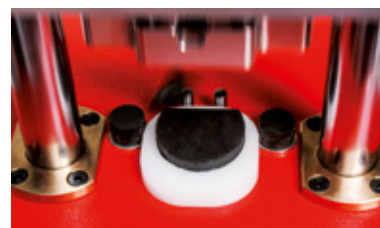
1 - Empty cutting area



2 - Place sample



3 - Active cutting by pressing the 2 control buttons



4 - Release control buttons - blade will return



5 - Cut sample

MonTech DisperCool 3000

Test sample deep freezing unit



The DisperCool 3000

is used for the preparation and sample conditioning of uncured as well as cured rubber samples prior to the cutting process - especially designed for Dispersion Testing.

The sample preparation process is very simple and convenient:

First the sample is pre-cut (if needed) and then easily placed in the quick-open sample holder and then inserted into the tabletop DisperCool unit. Inside the DisperCool chamber, silicon oil is pre-chilled to a low temperature from minus 20 to minus 40°C. The sample holder is placed into the chamber which can hold up to two sample holders.

Once the safety lid of the chamber is closed, the cooling process and integrated timer are immediately started.

During the cooling process, the sample is cooled to glass transition temperature. This means that a totally solid sample is produced.

The cooling / preparation time - usually between 5 and 12 minutes depending on the sample type and shape - can easily be set by the operator and can be monitored during the process on a count-down timer display.

Once the cooling time is over, the operator is notified by an acoustic signal allowing the operator to open the chamber lid and take out the sample holder along with the sample.

Now the sample at glass transition temperature can be cut and processed like a normal solid hard rubber sample without smearing, distortion or modification of the sample surface. The DisperCool 3000 provides perfect samples for conventional cutters or automatic cutters like the DisperCut 3000.

The whole DisperCool 3000 process is closed, sustainable and environmentally friendly as no consumables like liquid nitrogen or other cooling gases are required.



Technical specification

| | |
|-------------------------------------|--|
| Temperature range | -40 to 200°C (depending on cooling / heating liquid) |
| Cooling liquid | Silicone oil, approximately 3 liters |
| Chamber size | Approx. 170 mm x 90 mm x 170 mm (H x W x D) |
| Sample capacity | Two independent sample holders |
| Sample size | Max. 25 x 20 x 20 mm |
| Display | 6-digit timer display with acoustic signal 3,5" color-touch temperature display |
| Additional Inputs (optional) | PT 100 temperature port for immersion probes to measure temperature directly in the sample |
| Chiller capacity | Max. 420 Watts, air cooled |
| Electrical Requirements | 230 - 250 VAC, 50 – 60 Hz, 10 Amps |
| Output Interfaces | USB, RS232 |
| Protection levels | Configurable user input modes and levels Integrated temperature and level protection switches |
| Dimensions | Height: 500 mm Width: 425 mm Depth: 450 mm |
| Weight | 40.5 kg (net) |

Sample Preparation



Sample holder in chamber (lid open)



External Input and Output ports



Temperature touchscreen and timer display



Sample temperature recording by optional immersion probe

MonTech Worldwide Support, Maintenance and Calibration

Global customer support

Customer orientation is our top priority. That is why we are active on your behalf worldwide with one aim: to provide first-class service and support throughout the entire life-cycle of your instrument.

MonTech's customer support services include consulting, demonstration, pre-testing, successful and trouble-free commissioning, preliminary acceptance and installation, initial calibration, instruction on hardware and software, safety briefings, application seminars, workshops and of course, a continuous on-site hotline and remote support. We also supply testing film, consumables, spare parts and instrument upgrades or repairs.

Whenever our customers need help of any kind, we are at their service! Therefore, we are available 24 hours a day, 365 days a year worldwide.

Single source ISO 17025 calibration services

MonTech's on-site calibration service provides ISO 9001 certified and ISO 17025 accredited field calibrations to any brand, type or model of rubber testing machinery or lab equipment. These on-site service visits and calibrations are designed to be fast and reliable with minimum down time.

MonTech employs a global team of the most qualified field service engineers, strategically positioned for cost-effective service wherever calibration services or assistance may be needed.

Our KWP preventive calibration, maintenance and service program can be tailored to the customer's environments and specific demands for test data traceability with the highest instrument precision. On-site service intervals can be scheduled to minimize the risk of any unplanned downtime.



Service, maintenance, calibration

MonTech provides fully traceable calibration services using the latest equipment and methodology by highly skilled field service engineers keeping your instrument in a perfect shape. All work and calibration procedures are fully in compliance with ISO, ASTM, DIN and other applicable standards, proven by our ISO 9001 certification and ISO 17025 accreditation. This allows us to offer a huge scope of mechanical, dimensional, thermal and many other calibrations wherever your laboratories might be located.

Our services ensure that your testing instrumentation is reliably providing you with consistent and accurate data, instrument-to-instrument correlations and site-to-site crosschecks.

Preventive maintenance is essential to guaranteeing instrument performance in tough environments, producing accurate and reliable data and minimizing the risk of instrument breakdowns or unplanned downtime.



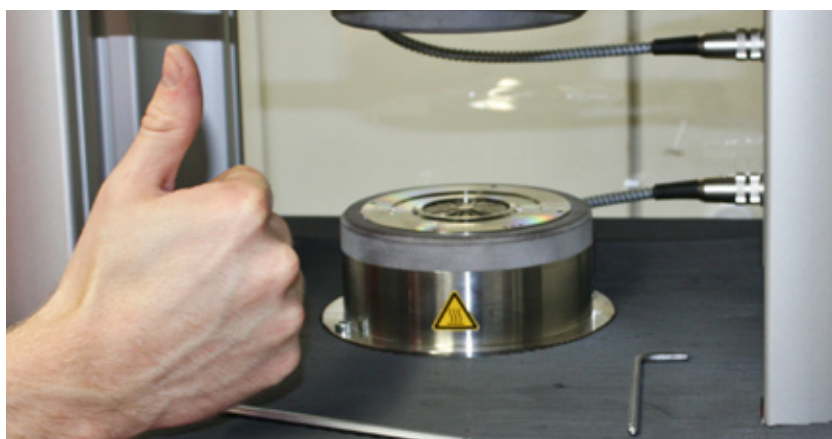
Deutsche
Akkreditierungsstelle
D-PL-11292-01-00
ISO 17025:2005



Quality Management

We are certified

Regular voluntary monitoring
according to ISO 9001:2008



Remote and emergency support

Our remote and hotline provides help and support whenever it might be needed.

Whether you might have questions on specific instrument applications, test setups, test executions, results, calibrations, correlations or diagnostics and troubleshooting, our superb team of technical and application specialists is only a quick phone call away.

Dedicated MonTech remote assistance software allows us to connect directly with the instrument in your lab, helping you with full instrument diagnostics, data transfer and immediate software and firmware updates.

Our qualified team of software specialists is available for any kind of IT assistance that might be needed for your laboratory operations including software coaching, configuration, re-installation, upgrades, data export and database setup.

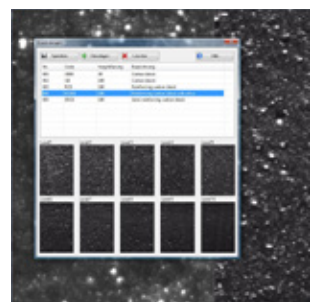
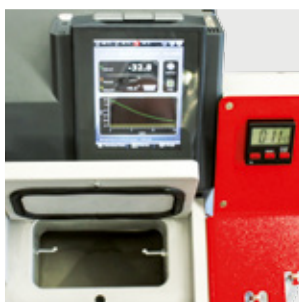
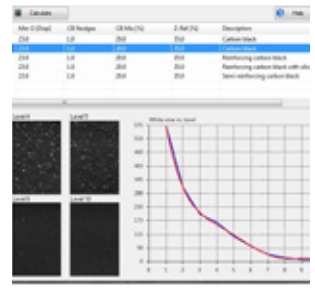
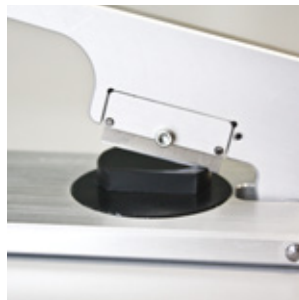
Training and application support

MonTech's unique range of training covers everything from basic rubber rheology and testing courses, software classes for data management and Laboratory Information Management System trainings, advanced polymer and rubber rheology seminars in different operator levels to high-end scientist courses.

MonTech helps you to ensure that you get the most benefits out of any investment in MonTech instruments or software, making these products a truly safe investment that you can rely on.

Training courses are offered at any MonTech facility or on-site in the customers laboratory with a tailored focus on their specific environment and challenges, including QA as well as R&D, consulting services for recipe development, raw materials, production and machinery including compounding and downstream processes. With these services we assist our customers to quickly increase efficiency and quality at reduced costs for an overall improved customer satisfaction and business performance requiring less internal resources.

Dispersion



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