



RUBBER INDUSTRY TESTING

HITEC Luxembourg S.A.

ABOUT US.

THE BASICS

HITEC Luxembourg S.A., a Luxembourg based technology provider, offers innovative high-quality products and services for space, automotive and rubber, traffic management, humanitarian aid as well as government and security.

Our products in the field of rubber industry testing are used worldwide with all major producers of carbon black and rubber goods. We develop and produce standard and customized testing equipment used in product development and in quality control. The industry acknowledged IPHT™, Individual Pellet Hardness Tester, is designed for reliable measurement of carbon black pellet hardness. DABS™, the Oil Absorption Basic System, is an oil absorptometer to determine the structure of carbon black and silica, as well as other rubber chemicals. CVST®, Compressed Volume Structure Tester, is the next generation instrument for quantifying structure and other material characteristics of carbon black, and potentially of any other granulate or powder.

The company's know-how in industrial engineering as well as in-house manufacturing makes HITEC Luxembourg also the ideal partner to develop and produce customer-specific solutions. An example is single end dipping systems to support product development of reinforcing yarn.

More than 100 different customers in over 25 countries demonstrate the success of our products and services.

A world map with a black background and white country outlines. Yellow dots of varying sizes are placed on the map to represent client locations. The dots are most concentrated in North America, Europe, and East Asia, with a few scattered dots in South America, Africa, and Australia. The text 'SERVING OUR' is overlaid on the bottom left, and 'CLIENTS WORLDWIDE' is overlaid on the bottom right.

SERVING OUR

CLIENTS WORLDWIDE

PORTFOLIO ●

PRODUCT & SERVICE OFFERING

We offer test equipment for quality control of rubber fillers conforming to appropriate ASTM International and ISO standards. The company is a voting member in ASTM International and is actively contributing with scientific input to improve and extend applicable standards.

We provide our clients with worldwide sales and customer support.



INDIVIDUAL PELLET
HARDNESS TEST



OIL ABSORPTION BASIC
SYSTEM



COMPRESSED VOLUME
STRUCTURE TEST



CUSTOMER-SPECIFIC
SOLUTIONS



IPHT

INDIVIDUAL PELLET HARDNESS TESTER

KEY FEATURES

Fully compliant to relevant international standards (ASTM D5230 and D3313 as well as ISO 8942)

Exceeds applicable standards

Automatic calibration

Connects to standard PC via serial port

Automatic equipment to determine carbon black crush strength, compliant to ASTM D5230 and D3313 as well as ISO 8942

IPHT is an automated tester to determine individual crush strength of carbon black pellets. The carbon black Pellet Hardness Tester has been initially developed in 1993 and is in use with many international manufacturers of carbon black and producers of rubber products.

Designed for reliable measurements of the individual pellet hardness and compliant to the relevant standards of ASTM International and ISO.

The extensive control software runs on standard Windows® based PCs and is constantly kept up to date to stay compatible with latest PC technology and to reflect possible changes to the respective standards.



IPHT-RASB

RANDOM ACCESS SAMPLE BUFFER

KEY FEATURES

Buffer for up to 14 samples with sequence of testing in any order as selected in control software

Pneumatics to automatically clean residues from the IPHT sample container after each test

No modification required on IPHT – only place into position and activate in software

Can be removed at any time to use IPHT as “simple” tester

This option can take 14 samples. It provides random access to any position as selected in the control software.

The carousel is stepper motor driven with a pneumatically actuated trap to transfer sample to tester. A transparent cover ensures easy filling and visual control of all positions and prevents accidental spillage.

The RASB connects via the IPHT’s secondary serial port and is controlled by the IPHT’s control software. The software supports test planning through instructions where to fill-in which sample according to your specific “Test List”. Furthermore, the software allows a high degree of flexibility in conducting tests: likewise tests can be added, deleted or sequence and priorities can be changed, even while measurements are running. A running sequence can be interrupted and tests can be inserted without actually going through the buffer.

IPHT-DTBL

VIBRATION DAMPING TABLE

KEY FEATURES

Damping table to reduce amplitude of low frequency vibrations

Optimised for maximum damping of the IPHT's most critical vibrations

Sized to take a basic IPHT tester only or an IPHT with the optional random access sample buffer RASB

Individual pellet hardness testing is by its nature sensitive to external noise. A pellet typically breaks at only about 0.07 mm compression (approx. 0.003") and consequently at ASTM specified conditions of 0.125 mm/s sample support speed, this happens within 0.6 seconds compression time.

The IPHT samples at 50 measurements per second to assure accurate determination of the compression curve and of the break point. For high measuring sensitivity and fast sampling rate, the possibility of filtering is limited and external vibrations may disturb the instrument. The IPHT software automatically supervises vibration in the standby mode and it even prevents to start a test if the mechanical noise is excessive.

This optional damping table is designed to protect the tester against excessive external vibrations. It is optimized to reduce the amplitude of the IPHT's most unfavourable frequency around 33 Hz, at which damping is up to 20 dB.

PMST

PELLETED POWDER MASS STRENGTH TESTER

KEY FEATURES

State-of-the-art design

Force measurement by load cell

Stepper motor driven plunger with position feedback of sample height

Single supply: wide range mains 90 to 240 VAC - that's all !

Table model: 59 x 44 x 95 cm
(W x D x H)

Test equipment to determine the mass strength of pelleted carbon black as per ASTM D1937

The test method ASTM D1937 "... is designed to determine the force required to pack a cylindrical column with pelleted carbon black. The results of this test are believed to relate to the ability of the carbon black to flow in bulk handling systems." ... "Mass strength gives an indication of the flowability in bulk handling. It is affected by pellet properties such as hardness, size, shape, and especially fines content."*

** Excerpts from chapter 1 resp. 4, of ASTM D1937-13*

- Motor controlled accurate load application
- Linear carriage with load cell, stepper motor driven up to 15 mm/s and with position reading
- Programmable controller with 5.7" display, 640x480 px
- 4 robust push buttons for "dirty" operations
- Anodized aluminum frame and fully dust proof stainless steel electronic cabinet
- Software guided measurement sequence according to ASTM D1937
- Software guided load cell calibration
- Compact table model – small footprint
- AC mains supply only (no compressed air)



DABS

OIL ABSORPTION BASIC SYSTEM

KEY FEATURES

Compact design with small table footprint

Fits standard mixing chambers, while safety cage allows for easy access to chamber for filling and cleaning

Selectable variable rotor speed and oil debit rate

Supports several burette models

State-of-the-art oil absorption data system compliant to ASTM D2414 OAN and D3493 COAN for carbon black, ASTM D6854 for silica, as well as ISO 4656

DABS is an oil absorption system to determine structure of carbon black and silica, as well as oil absorption of other powder material, also known as DPB absorption, DBP number or DOP number.

The data treatment for recording of a full mixing curve was initially developed as of 1996 by HITEC Luxembourg and is since then constantly further extended to satisfy increasing performance requirements. The curve fitting by a polynomial of 3rd order was a result of this initial development and has been introduced as “procedure B” in ASTM D2414.

A dedicated data acquisition system only, to connect to old model absorptometers is at the base of the full model absorptometer DABS. It can still be acquired as DADS-TERM to enhance such classic absorptometers.

DABS-MCEF

MIXING CHAMBER EXTENSION FUNNEL

KEY FEATURES

Allows testing of high-volume materials (280 ml volume extension)

Perfectly fits on top of the DABS mixing chamber

Made of aluminium

Easy to clean

Testing fluffy materials such as non-pelletized carbon black requires higher volume to make up the same weight of sample.

The MCEF chamber extension funnel fits on top of the absorptometer mixing chamber. It also fits inside the safety cage of the HITEC Luxembourg DABS absorptometer. With its versatile design, the burette tip can be positioned at any height above the chamber, so the tip can be conveniently placed over the sample with or without the extension funnel.

Because the extension fits perfectly inside the hinged safety cage, its use has absolutely no effect on the handling of the sample, on the testing itself or on the cleaning.



DABS- -MCCB, -MCTS, -CBQC MIXING CHAMBER TEMPERATURE CONTROL

KEY FEATURES

Maintain and monitor constant temperature of the mixing chamber

DABS-MCCB

Mixing Chamber Cooling Block

DABS-CBQC

Cooling Block Quick Coupling set

DABS-MCTS

Mixing Chamber Temperature Sensor

Continuous testing with the oil absorption system generates heat. ASTM specifies the temperature of the mixing bowl to be 23 ± 5 °C. HITEC Luxembourg even recommends keeping the tolerance at ± 3 °C to improve the repeatability.

DABS and DADS-TERM (version 2 and up) are equipped with a Pt100 3-lead signal input to monitor the temperature of the bowl with the help of the appropriate temperature sensor MCTS.

The values at beginning and end of a test appear on the printout. If required, the bowl temperature can be kept low with the help of an external cooling bath. The optional cooling block MCCB fits around the mixing bowl and is connected to a separate cooling circuit. Note that the temperature sensor can also be used without the cooling block. The quick coupling set CBQC is very convenient to easily connect and disconnect the cooling circuit. Standard is for 9 mm (3/8") hose. The quick couplings are equipped with self-shutting valve when disconnecting.

CVST

Compressed Volume Structure Test

KEY FEATURES

Most advanced design on the market

Two force sensors for applied and transmitted pressure

Backlash free drive for controlled compression and decompression

Residual void volume reflecting COAN structure

Material friction losses reflecting NSA/STSA surface

The CVST by HITEC Luxembourg is a void-volume tester, which is derived and further developed from the ASTM standard D6086 "Standard Test Method for Carbon Black—Void Volume (VV)" and compliant to the new ASTM standard D7854 "Carbon Black—Void Volume at Mean Pressure".

The void volume of a carbon black expressed as a function of mean pressure is a carbon black structure property. The greater a carbon black resists compression by having substantial aggregate irregularity and non-sphericity, the greater the compressed volume and void volume.

Compressing carbon black powder breaks its agglomerates and aggregates to a similar extent as in the sample preparation for the compressed oil absorption COAN as per ASTM D3493. By measuring the decompression of the powder it is possible to derive a residual void-volume, which reflects well the COAN - this is naturally intuitive as it describes the powder in a similar physical condition (i.e. in uncompressed state after breaking agglomerates/aggregates).

With an exchangeable compression chamber, it is possible to optimize this new method for best testing conditions. Its control software, which is under constant evolution, can further determine other characteristic responses like material friction, work absorbed by compression/decompression, etc.

The CVST by HITEC Luxembourg complies with the present and future requirements of standards on void-volume, but above all it may become the ONE instrument to characterize material, fast clean and easy – carbon black, and other powder or granulate materials.

AMSC

AUTOMATED METRAVIB SAMPLING CUTTING

KEY FEATURES

Precise and reproducible cutting of rubber edges

Minimizes risk of injuries compared to manual cutting

Typical sample dimensions:

- diameter 10 mm
- three steel blocks of 14 mm length
- two rubber sheets of 2 mm thickness

Trimming of rubber test samples for Metravib Dynamic Mechanical Analyser DMA*

The AMSC is designed for preparing samples to be tested on a Metravib dynamic tester (DMA), in a way to minimize variations on the sample and its measuring results, which may be caused by operator influence (e.g. irregularities in the cutting edges).

Furthermore, the use of this equipment reduces significantly the risk of injuries compared to the manual off-cutting of sample material.

The standard instrument is factory adjusted for samples of 10 mm diameter, build with three blocks of length of 14 mm and two rubber sheets of approximate thickness of 2 mm – other dimension are possible.

*) The DMA is available from 01dB-Metravib, 200 Chemin des Ormeaux, F-69578 Limonest, France

SEDU

SINGLE END DIPPING UNIT

KEY FEATURES

Modular number of zones, dipping stations or drying ovens – any combination is possible

Master-slave drive motor system – any motor can be master

Regulated yarn tension or fixed speed ratio, individually selected for every zone

Very precise and reproducible process conditions – can be changed on-the-fly

Fast stabilization of tensions concurrently in all zones and extremely stable conditions

Unwind station with unique tension-controlled yarn buffer for on-the-fly change-over of feeding bobbin

Laboratory size single end dipping unit for material & process development for reinforcing yarn and validation of yarn-to-rubber adhesion

SEDU is a modular system to process a single yarn such that it is fully tension controlled from un-winding of standard bobbins, through dipping, through drying and finally up-winding on bobbins for further handling. The master controller handles multiple stretching zones in regulated tension mode or fixed speed ratio, it controls temperature of the ovens, and it meters and monitors the process in retrievable data files, while conditions can be changed on-the-fly.

It can be used to revamp existing laboratory systems (e.g. Computreater® from Litzler) or be adapted to other machine designs. It can even be proposed as new, typically custom designed installations.

CUSTOMER-SPECIFIC SOLUTIONS ●

We offer our clients comprehensive solutions: from analysis to consulting, from development and implementation of customer-specific solutions up to installation and maintenance. In all these phases a close cooperation with clients and partners to spot exactly the needs and requirements is essential.



HITEC Luxembourg offers high technology solutions covering different business areas: satellite ground segment technology, customer specific and standard equipment for testing and measuring of physical properties, engineering, consulting, software & ICT development and project management.

Quality management and assurance, corporate social responsibility and environmental friendly business are the basis for sustainable growth and long-term partnerships with our stakeholders.



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