TURBISCAN

Master the stability of dispersions Emulsions suspensions and foams

Multiple Light Scattering
Optical measurement of particles concentration and size

TURBISCAN is the reference for stability analysis

Turbiscan is used world-wide to detect at an early stage all kinds of destabilisation such as coalescence, flocculation, creaming, sedimentation, etc…

Various products such as emulsions, suspensions or foams can be studied from low to high concentrations without any sample preparation or dilution.

Stability kinetics and index are measured for an efficient sample analysis and comparison.

MLS SOLUTIONS
The Turbiscan works on Multiple Light Scattering in both Transmission (T) and Backscattering (BS) mode, in order to analyse low and high concentration dispersions.
T &BS signals depend on particle size and concentration: $BS \& T = f(d/\varphi)$

- Size range: 1 nm to 1 mm ;
- Concentration range: 0.0001 to 95% v/v ;

SCAN CONFIGURATION
The Turbiscan acquires T & BS every 20 microns along the sample height, thanks to patented scanning reading head.
Scans are repeated during sample ageing time to detect any variation of the signal due to a destabilisation, such as particle migration and/or particle size

Transmission Detector

Light Source (Near IR)

Backscatter Detector
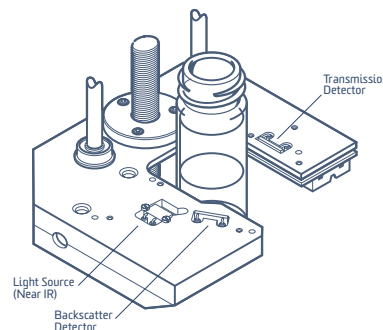
DATA REPORTING
The software provides multi-level data treatment for both experts and non-experts.

- The **Turbiscan Stability Index (TSI)** is a one-click feature providing the key number depending on the global stability of the sample. It is a quick and easy way to characterize the sample, and enables the user to compare & rank various formulations.
- Kinetics computation based on the raw signal allows to **identify and quantify** in detail the phenomena taking place in the samples, depending on size and concentration variations.
- The user can compute the evolution of the mean particles diameter or concentration during the ageing of the product in any part of the sample.
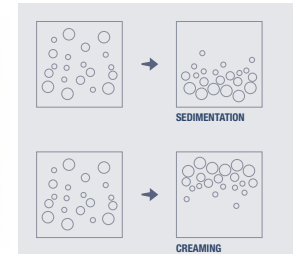
Light Source — Detector — BS=70%

Light Source — Detector — BS=35%
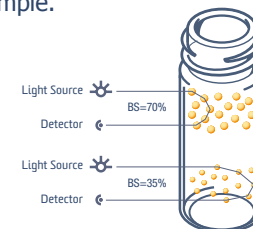
STABILITY
No variation of BS and T

STABILITY
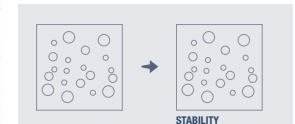
PARTICLE MIGRATION
Local peaks of variation of BS

SEDIMENTATION

CREAMING

PARTICLE SIZE VARIATION
Global variation of BS or T on the whole height

COALESCENCE / FLOCCULATION
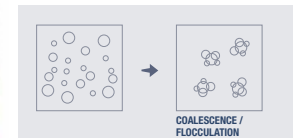
Fullbrook Systems

HOME & PERSONNAL CARE
- **Emulsions, lotions, creams**: Significantly decrease time of stability analysis (up to 200 times).
- **Sun creams**: Difficult to analyze by visual observation, Turbiscan detects and quantifies the destabilization of the different particles.
- **Make-up**: Detects sedimentation of foundation, nail varnish, lipsticks.
- **Foams**: Easy way to follow the bubble ripening and the drainage.
- **Shampoos**: Stability of pearlescent agent.

PHARMACEUTICALS
- **Vaccines**: Kinetic of particles aggregation and sedimentation (proteins, metal oxides...).
- **Skin lotions and creams**: Detection of coalescence and creaming up to 200 times faster than visual test.
- **Ophthalmic suspensions**: Study of the re-dispersion of active ingredient after storage.
- **Inhalers (pMDI)**: Study of particles aggregation & sedimentation in pressurized measurement cells.

PAINT & INK
- **Sedimentation**: Analyse the settling rate in suspension.
- **Aggregation**: Monitor the size variation in the suspension.
- **Packing**: Analyse the formation of a cake at the bottom of the sample.
- **Redispersibility**: Be sure that shaking or stirring gives your sample its initial properties back.

FOOD
- **Dairy products**: Quantify and detect characteristic destabilization of milk based products : particle size variation, creaming of fat droplets, sedimentation of calcium or chocolate particles.
- **Flavour emulsions**: no dilution required to detect droplet size variation.
- **Soft drinks**: ring formation, colour change, pulp sedimentation.
- **Desserts**: Detect destabilization phenomena of cream, dessert foam, ice cream.
- **Raw materials**: monitor the efficiency of stabilizers, thickeners…

OIL & PETROLEUM
- **Stability of Fuel oils**: Analyze stability reserve in 15 minutes thanks to the ASTM D706.
- **Stability of Crude oils**: Analyse aggregation and sedimentation kinetic of asphaltenes.
- **Efficiency of additives for demulsification**: Qualify the best additive in order to de-emulsify water-in-oil emulsions.
- **Efficiency of dispersants for asphaltenes**: Measure asphaltene aggregation kinetics versus dispersant amount.
- **Quantification of amount of additive**: Save costs by using just needed quantity of additive.
- **Stability of drilling fluids**: Detect and quantify destabilization phenomena.

ELECTRONICS
- **Slurries (CMP...)**: easily check the homogeneity & stability of slurries before next steps of the process.
- **Electronic components (MLCC...)**: quality of the dispersion state during the production of Multi-Layer Ceramic Capacitors.
- **DisplaY (LCD, LED, e-Paper, QD...)**: influence of additives on dispersion stability.
- **Energy (Solar cells, Fuel cells, Secondary battery, DSSC...)**: quality and homogeneity of the inks coated to the solar cells.
- **Printed electronics (Conductive inks, RFID, Flexible displays...)**: check the size variation of nano particles in electronic inks.

BENEFITS

NON-CONTACT MEASUREMENT - TRUE STABILITY
Measurement is done without any mechanical or external stress, and without any dilution, thus allowing the monitoring of the ageing of the product.

OPTICAL AND THERMAL ACCELERATION
Thanks to the high optical resolution (up to 100x faster) and the possibility of high storage temperatures (up to 200x faster), stability tests have never been shorter.

IDENTIFICATION AND QUANTIFICATION
Easily identify and quantify the destabilisation phenomena in the samples, in order to rank and compare all your formulas.

VERSATILE TECHNOLOGY
The user can study all kinds of liquid dispersions (emulsions, suspensions, foams, etc…), with concentration up to 95% v/v, over a wide range of sizes (1 nm to 1 mm).
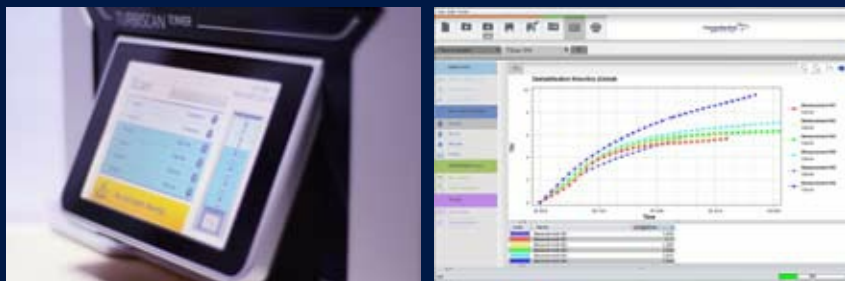
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NEW

TURBISCAN TOWER

Be on Top of your **Dispersions Stability**

True Stability
thanks to analysis under real conditions (no stress), up to 200 times faster than visual observation

Up to 6 samples
more samples at a time, in a reduced space, thanks to a vertical design

4– 80°C temperature range
for a better control and simulation of shelf-life conditions

State of the art software
new Turbisoft 2.0 for easy and automated comparisons of your samples'stability

PROCESS

TURBISCAN ONLINE

TURBISCAN HEAVY FUEL

No

No

tsi
COMPUTATION

Turbiscan Stability Index

Based directly on the raw data, this unique number takes all destabilisation into account, providing you with a powerful tool to rank & compare all your formulas in just one-click.

Determining shelf-life of your products has never been easier!

TURBISCAN CLASSIC

From lab to production scale

Process design, scale-up and control are key steps to guarantee the quality of the manufactured products. This instrument is designed for laboratory conditions and production constraints, allowing to control any process.

- **Measurement in real time (up to 0.1s frequency)**
- **Monitor the dispersion state during process (emulsification, grinding, precipitation, etc...)**
- **Working conditions: 5 – 100°C / 1– 10 bar**

Dedicated to Oil & Petroleum

This adapted version of the Turbiscan Classic measures the stability of fuel oil, crude oil, drilling fluids, effect of additives, water-in-oil demulsification.

- **Easy to use with its 1-click software**
- **Portable and robust**
- **Compliant with ASTM D 7061: for Heavy Fuel Oil analysis (determine the Stability reserve)**

### Basics of the technology for short-term stability

Turbiscan Classic helps to optimise the pre-formulation work by giving a quick insight into the instability phenomena. The first generation of Turbiscan range is still a success after 20 years:

- **Identification and quantification of instability**
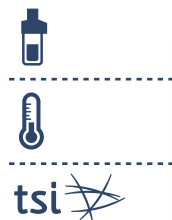- **Quick and Reliable**
- **Robust**

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NANO

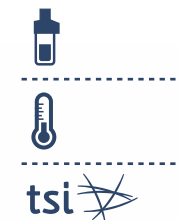**Available in Nano version :**
explore even lower
concentration and size

tsi

NEW

tsi

tsi
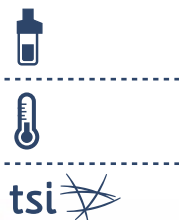
TURBISCAN LAB

TURBISCAN TOWER

TURBISCAN AGS

The reference stability analyser

Accelerate and document ageing tests for a fast and deep understanding of destabilisation mechanisms (creaming, sedimentation, flocculation, coalescence).

Turbiscan™ LAB can be used in both R&D lab for formulation development and QC labs to control the stability of raw materials and final products.

- **Identification and quantification of instability**
- **Long-term stability analysis**
- **From RT to 60°C**

The new reference, 6 times

The brand new spearhead of the Turbiscan range to fully characterise the stability of concentrated dispersions (emulsions, suspensions, foams). Discover its new patented mechanical design, for an even better performance.

- **Up to 6 samples at a time**
- **From 4°C to 80°C**
- **Higher vertical resolution: acquisitions every 20 microns.**

High throughput stability

High throughput screening is more and more useful to shorten the formulations time-to-market. Turbiscan™ AGS integrates the Turbiscan™ LAB, a robot, a storage station and a smart software for automatic sample handling and treatment.

This concept enables an automated management of ageing tests from sample storage at different temperatures to shelf-life determination.

- **Up to 54 samples**
- **3 storage racks from RT to 60°C**
- **Traceability, reproducibility, objectivity**

	TURBISCAN CLASSIC	TURBISCAN LAB	TURBISCAN LAB (NANO)	TURBISCAN TOWER	TURBISCAN AGS
Emission (Light Source)	850nm	880nm	Blue	880nm	880nm
Detection	MLS	MLS	MLS	MLS	MLS
Cell Volume	7ml	4 or 20ml	4 or 20ml	20ml	20ml
Quantitative monitoring of dispersion stability					
Turbiscan Stability Index (TSI) computation					
Migration velocity & hydrodynamic diameter					
Disposable glass cells					
Automatic reporting					
Automatic samples recognition (bar-code)					
Temperature control		T,E (RT+5°C to 60°C)	RT+5°C to 60°C	4 to 80°C	RT+5°C to 60°C
Mean diameter and volume fraction					
Multi-samples				6	54
Storage at 3 different temperatures					
Dimensions (cm)	27.5x13x23.5	38x42x32	38x42x32	35x45x90	145x75x85
Weight (kg)	5	13	13	45	50
Recommended PC configuration	Intel Dual Core @ 2.5Ghz or AMD X2 processor / 4Gb RAM, USB / Microsoft Windows XP or 7, 32/64 bits				

	HORUS	RHEOLASER LAB	RHEOLASER LAB6	RHEOLASER MASTER
Emission (Light source)	650nm or 850nm	650nm	650nm	650nm
Detection	MS-DWS	MS-DWS	MS-DWS	MS-DWS
Cell Volume		4 or 20ml	4 or 20ml	4 or 20ml
Storage positions		6	6	6
Simultaneous measurements	1 to 4	1	6	6
Temperature range		RT+5°C to 60°C	RT+5°C to 60°C	RT+5°C to 90°C
I* measurement				
Gel Point measurement				
Minimum viscosity (mPa.s)		500	500	15
Dimensions (cm)	70x60x62	60x40x30	60x40x30	60x40x30
Weight (kg)	45	36	36	36
Recommended PC configuration	Intel Dual Core @ 2.5Ghz or AMD X2 processor / 4Gb RAM, USB / Microsoft Windows XP or 7, 32 bits			