TURBISCAN® TRILAB – TECHNICAL SHEET

1) Technical specifications and recommendations

Technology	Static Multiple Light Scattering (SMLS)
Wavelength (nm)	LED 880nm
Detectors	Backscattering and Transmission (for further information, see technical application note "Description of SMLS method for the evaluation of mean particle size in concentrated dispersions. ")
Displacement interval max. resolution	5µm
Maximum displacement velocity	15mm/s
Scan step resolution	20µm
Sample preparation	Native sample directly in the measurement cell, no dilution, no destructive method
Measurement cells volumes (proposed by Formulaction)	4 and 30mL Note 1 : 4mL cells requires an adaptor provided by Formulaction Note 2 : Formulaction can provide custom adaptors on demand
Minimum sample volume	1.5 mL
Maximum sample volume	30 mL
Particle size range	10nm – 1mm (depending on physical parameters)
Concentration range	10^{-4}% - 95% v/v (depending on physical parameters)
Available calculation	TSI, TSI bottom, TSI middle, TSI Top, TSI manual, videos, mean value, phase thickness (mm), migration rates, mean particle size d_{SMLS}, Hydrodynamic particle size d_H
Sample typology	✓ Non absorbing samples (diffusive samples) : stability + d_{SMLS} ✓ Absorbing samples (black samples) : stability + d_H
Particle size validity conditions	✓ For diameter based on **optical parameters (d_{SMLS})**, the determination is only valid for diffusive samples. ✓ d_{SMLS} available only with 30mL cells and for Turbiscan LAB expert (Turbiscan LAB Standard and Thermo are not calibrated for d_{SMLS} measurements)
ISO compliant	TR 13097/TR 18811/TR 13014
Dimension & weight	35 x 48 x 58 cm – 35kg
Space required	Keep a distance of 30 cm minimum from each side
Recommended computer configuration	✓ 2.5 GHz processor ✓ 4 GB RAM ✓ SSD or 7200rpm HDD ✓ Minimum 1 USB Port ✓ Microsoft WINDOWS 10 ✓ Screen resolution 1920x1080
Barcode reader	Yes

Primary calibration	All instruments are factory calibrated (backscattering and transmission signals) based on specific and traceable standards. The instrument is provided with calibration check-up standards for onsite calibration control (see above). In case of signal intensity deviation, only trained Formulaction's representatives can recalibrate the instrument
Calibration standards for instrument check-up	Teflon (PTFE) for Backscattering and Silicon Oil for Transmission (provided in a black box and included with the instrument) Validity: Calibration standards set is valid for 10 years if kept in the black plastic case at standard room temperature and humidity (serial number two first digits indicate production year) Traceability: Calibration standards set is tracked by Formulaction with supplier batch number identification Data sheet: available under request.
Calibration check-up frequency recommendation	Instrument calibration check every 3 months
« what corresponds to the 00 :00 :00 scan time"	"it corresponds to the starting time of the very first scan"
Maximum scan frequency	25 seconds for one scan measurement in position 1
Maximum Scan number	600 scans
Reproducibility (corresponds to manual reproducibility with 10%-1µm latex sample for 10 scans with sample in and out between 2 scans)	0.05%
Repeatability (corresponds to automatic reproducibility with 10% 1µm latex sample for 10 scans with sample remaining inside the instrument between 2 scans)	0.05%
Operating temperature	We recommend to keep a constant temperature during scan acquisition. Temperature variation affects refractive indices and signals intensity
Temperature range	[20°C-60°C]
Temperature adjustment step	0.1°C
Temperature accuracy	Thermoprobe Pt 100 ceramic CEI 60751 class A 3 strands
Thermal security	Thermostat switch with switch off at 110°C Switch action : Trip free manual reset: UL M2 class rating
Voltage	Acceptable voltages are between 100V and 240V AC
Power consumption	900W
Electromagnetic compatibility and safety	See Declaration of conformity

Radiation	No laser, LED power<1mW, class 1 (non directly visible)
Spare parts availability	Spare parts availability is guaranteed for 10 years.
Preventive maintenance	Formulaction recommends preventive maintenance every year (replacement of wearing parts, cleaning and calibration)

2) Consumables

Items	Consumables	Composition	Thermal stability
Cells 20mL	Glass cell	Flat bottom borosilicated glass superior quality 1st hydrolytic class (type1) (external diameter27.5x72.5mm height with wall thickness 1.2mm) Cells are disposable. Rinse-off may lead to measurement quality issues. Cells must be changed after 3 washing cycles maximum to ensure glass quality	700°C
	Cap	Polypropylene	Up to 130°C
	Seal	Butyl/PTFE	-40 to 120°C
Adapter	For 4mL cells	Anodized aluminum	600°C
	For crimp cell	Anodized aluminum	600°C
Sampling rack		Thermoplastic (POM)	-40 to 115°C
Cells 4mL	Glass cell	borosilicated glass superior quality 1st hydrolytic class (type1) (external diameter 15mmx45 mm height)	700°C
	Cap	Phenolic cap	Very good resistance
	Seal	PTFE	-200°C to 260°C
Viscous product & foam cells	Glass cell	Borosilicated glass superior quality 1st hydrolytic class (type1)	700°C
	Bottom stopper	PTFE	-200°C to 260°C
	O ring	FKM Fluorocarbon rubber	-20 to 200°C
	Cap	Polypropylene	Up to 130°C
	Seal	Butyl/PTFE	-40 to 120°C
Crimp cells	Glass cell	Flat bottom borosilicated glass cells superior quality 1st hydrolytic class (type1) (22.5x75.5mm)	700°C ***Pressure:* Up to 10 bars with adapted caps**
	Stoppers or crimp caps	Not provided	NA

Note 1: Elements autoclavable separately, not guaranteed on closed cell

Note 2: for chemical compatibility, please consult compatibility data table

3) References

- **Consumable's listing**
- **IQ-OQ**
- **Declaration of conformity in the instrument user guide**
- **Backscattering and Transmission standards data sheets**