ORBIS BV

STARDist

Innovation in distillation testing
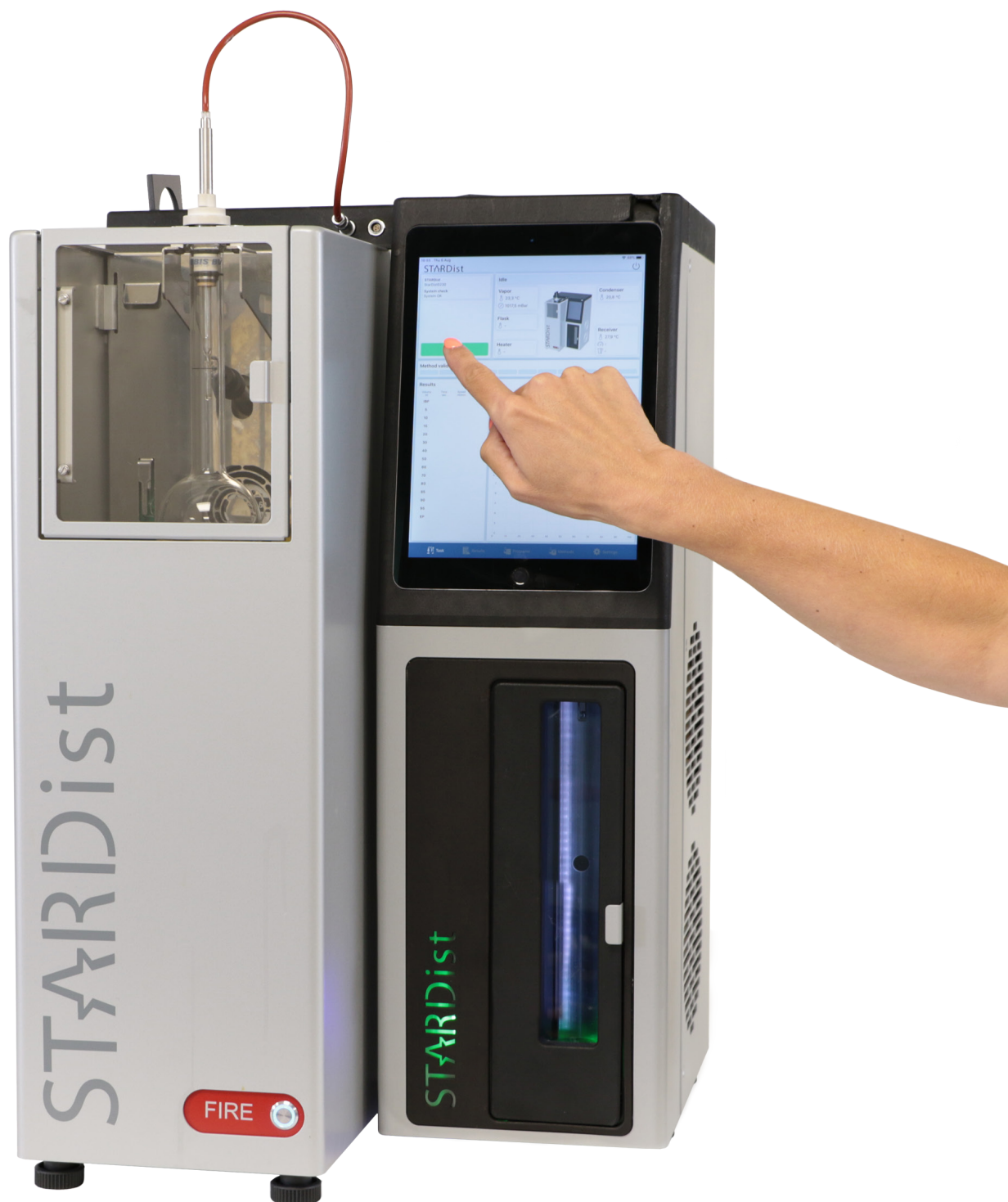
Automatic Distillation testing

by Orbis BV

STARDist – Automatic Distillation Unit

Excellent performance in D86 testing.

STARDist offers unique features unseen in any other instrument, such as: **Optical Dry Point Testing**, **PreScan** for vol. & temp. normalizing, **VOC Cold Trap** for loss reduction and **efficient condenser cooling**.

Performance:

The ASTM D86 method is full of details that affect distillation results. For instance; sample start temperature, condenser cleaning, vapor probe position, boiling stones, heater plate, distillation speed and ,many more.

Because the operator plays a critical role in getting these details right, STARDist offers **Guided Setup**; a step by step support that not only explains the *how* but also *why* of each step. More seasoned STARDist users can skip Guided Setup, depending on their user rights.
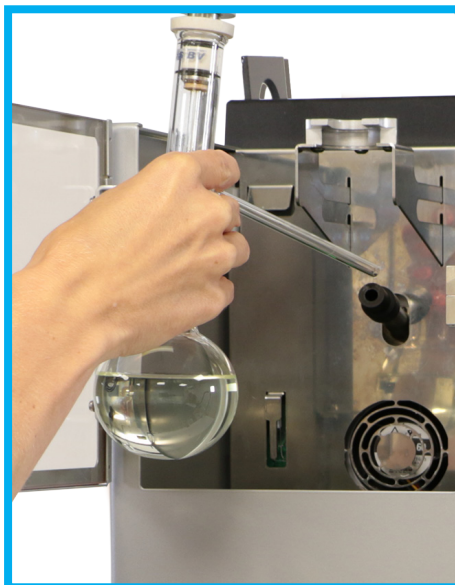
STARDist's **accurate temperature measurement**, **precise volume detection**, **early speed prediction** and **agile heater control** further guarantee excellent distillation behavior on important parameters such as IBP, distillation rate and FBP. Even with difficult or unknown samples on the first test.
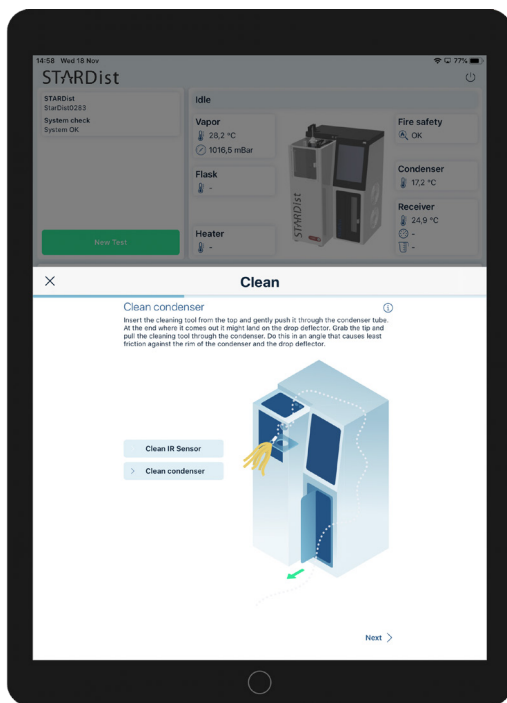
Guided Setup
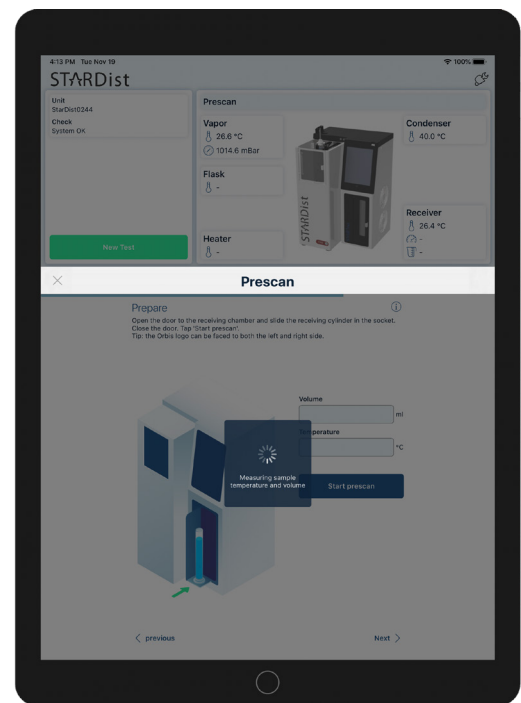
PreScan

Flask Holder

Always correct Pt100 position

Optical Dry Point

No external dry point probe required

Volume Scanner

Accurate detection of sample volume

Sofware:

While the workflow feels easy and intuitive, the STARDist app offers complete distillation control and in-depth insight in test results.

Modern ways of data handling such as "print pdf", "create JSON/XML file" and "export to LIMS/Windows PC" make STARDist easy to integrate in any laboratory data workflow.

The STARDist software is license-free, continuously supported by Orbis and available as a free download in the App Store.
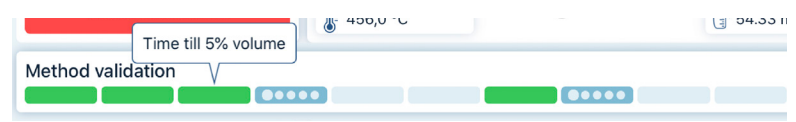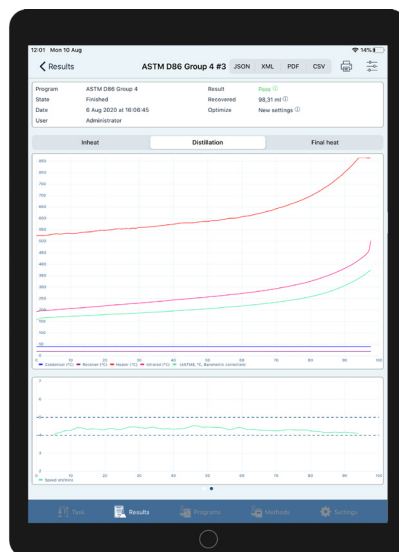

Validation
Real time validation against 11 method-defined limits such as Time till IBP, Condenser temperature, FBP Time-out.
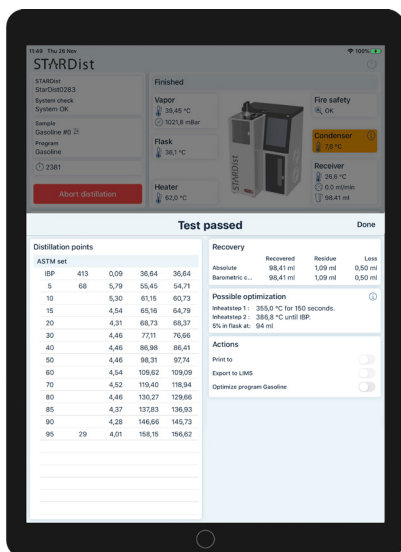
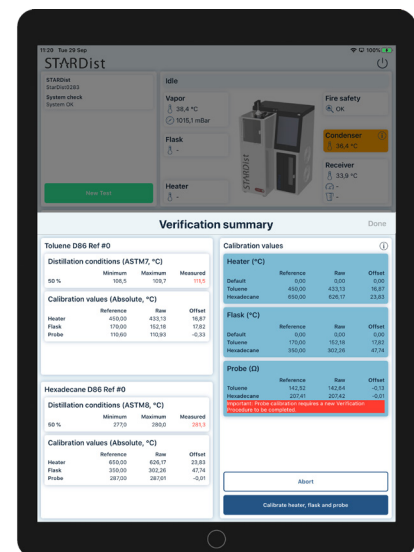**Summary**
Complete overview with quick access to most relevant data and actions such as print, export to LIMS and Optimize.

Results
Create and report any custom point (e.g. temp. at 250°C) even after the test is long finished. Print results in both extensive table and graph

Verification & Calibration
Easy-to-follow workflow for quarterly verification and yearly calibration procedures.

Technical specifications

Methods	ASTM D86, D1078, D850, E123, IP195, DIN51751, ISO 3405, GOST 2177, JIS K2254.
User interface	iPad with STARDist app software. *Available in App Store. App & updates are free of charge.*
Operator support features	Guided Setup: easy to follow start up procedure to ensure all operators act the same (set mandatory on/off in user settings) PreScan: measures sample volume and temperature in the receiving chamber before each test. Actual measured volume is then normalised to 100% volume, and receiving chamber temp. is automatically set to sample temp. (provided whithin method limits). Results validation: quick pass / fail test validation against method limits such as "time to IBP", "FBP temp.", etc. Optimization: automatically optimizes program settings with fixed InHeat and Final Heat settings after first distillation test. Flask holder: ensures easy and correct flask positioning for both 125 ml and 200 ml flasks. The vapor probe's height position relative to the flask's side arm is always correct thanks to the vapor probe design in combination with the strict flask dimensions.
Heating control	Smart multiparameter-based algorithm calculates and applies the required heater settings for IBP, FBP and (4-5 ml p/min.) speed control in real-time. Suitable for unknown samples and/or complicated blends such as E20. Speed control range: 2-11 ml p/min.
Heating system	Low mass/low voltage heater. 2 user adjustable fans for extra fast cooling after test. Automatic heater lift with correct flask pressure & positioning. Automatic shut-off in case of fire.
Condenser cooling	Solid state: based on Peltier elements with heat-pipe assisted heat sinks and silent fans for heat dissipation. No liquids involved. Condenser temperature can be increased during the distillation to deal with "light start / heavy end" products to prevent both evaporation loss and product waxing in the condenser tube. Temperature range: 0 – 65°C. Resolution 0.1°C.
Volume detection	Smart HD CCD camera for accurate volume measurement. Detects actual bottom of meniscus. Suitable for "smoke producing" products. Automatic calibration of the camera against cylinder. Resolution: 0.01 ml, accuracy: 0.01 ml, charge volume: 0-105%.
Receiving chamber	Built-in drop deflector. Cooling: similar to condenser cooling. 1 sensor for receiver chamber temperature and 1 sensor for sample temperature. Automatic lift moves receiver cylinder up to be sealed at the top, where a small hole ensures exposure to atmospheric pressure. *Then; a tube laid along the condenser tube acts as "VOC Cold Trap", preventing vapors from escaping the receiver (loss).* Temperature range: 0 – 45°C. Resolution 0.1°C.
Residue & Loss	Various options for residue measurement: automatic prediction, camera measurement, manual measurement and preset value. Loss correction is automatically applied to temperature readings.
Vapor temperature measurement	PT-100 class A probe with 10-point calibration data storage and automatic probe ID detection. Calibration certificate standard supplied. True dynamic simulation of ASTM 7 & 8 in-glass thermometer behavior (lag time and emergent stem). Range: 0 – 450°C ASTM / 0 – 500°C absolute. Units: °C, °F.
Dry point detect.	Optical Dry Point: IR sensor for automatic dry point detection. No dry point probe required. *(Conventional dp probe still available)*
Pressure	Built-in pressure sensor. Automatic correction of temperature results to atmospheric pressure. Range: 70 to 110 kPa, res. 0.1 kPa.
Cetane index	Built-in function for automatic calculation of cetane index.
Fire safety	UV sensor for fire detection. Built-in fire extinguisher. N or CO2 supply required from lab (connection hose is supplied).
System health	Automatic quick system health check before every distillation run to ensure all components are in excellent state.
Connectivity	1 x RJ45 (LAN) for connection to LIMS, Windows PC, FTP server, Kiosk printer and/or connection between multiple STARDist units.
Dimensions	Dimensions: 40cm x 40cm x 63cm (WxDxH), weight: 40 kg
Accessories	Kiosk printer
Voltage	100-240 VAC 50/60 Hz
Power	1200 W
Lab conditions	Environment temperature 10°C – 30°C. Environment humidity up to 80 % at 30°C.

STARDist ordering information

STARDist Automatic Distillation Unit
Part No. 913021.

Basic consumable kit For ASTM D86 testing
Part No. 913030. Includes:
- PT-100 temp. probe including calibration report
- Distillation flask 125 ml straight neck
- Centering device for 125 ml flask
- 100 ml receiver with brass foot
- 38 mm ceran heater plate
- 50 mm ceran heater plate
- Boiling stones 25 gr.
- Condenser cleaning tool

ASTM D1078 / D850 pack Add-on pack for 913030
Part No. 919114. Includes:
- 25 mm ceran heater plate
- 32 mm ceran heater plate
- Distillation flask 200 ml straight neck
- Centering device for 200 ml flask

Accessories and consumables:

Part No. 919061	- Heater element for STARDist
Part No. 919123	- PT-100 vapor probe
Part No. 919120	- Centering device 125 ml flask
Part No. 919121	- Centering device for 200 ml flask
Part No. 919030	- Set of 5: Distillation flask 125 ml
Part No. 919031	- Set of 5: Distillation flask 200 ml
Part No. 919105	- 100 ml receiver with brass foot
Part No. 919106	- Set of 5: 100 ml receiver without foot
Part No. 11003	- Condenser stopper cap
Part No. 919033	- 25 mm ceran heater plate
Part No. 919034	- 32 mm ceran heater plate
Part No. 919035	- 38 mm ceran heater plate
Part No. 919036	- 50 mm ceran heater plate
Part No. 919081	- Boiling stones 25 gr.
Part No. 919039	- Condenser cleaning tool

OTHER ORBIS BV PRODUCTS:

AIRSTAR

- Cloud and Pour Point Testing
- Cold Filter Plugging Point Testing

Features:
- ColdBlock: AirSTAR's integrated cooling unit (to -105°C)
- CFPP & CP/PP Heads: easy to use & exchangeable
- Traditional Cloud, Pour and CFPP test methods

IORBIS BV
Innovation in distillation

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Your local distributor: