LAB 4.0 – budućnost kontrole kvalitete *„U“*, *„NA“* i *„OKO“* kolnika

LAB 4.0 - The future of quality control *IN*, *ON* and *AROUND* the Pavement

Matthias Martus & Ersun Görener

8. međunarodna konferencija ASFALTNI KOLNICI 2023. 8th International conference ASPHALT PAVEMENTS 2023
Opatija 11. – 12. 05. 2023.

The future of quality control in, on & around the pavement

12.06.2023

Presenters

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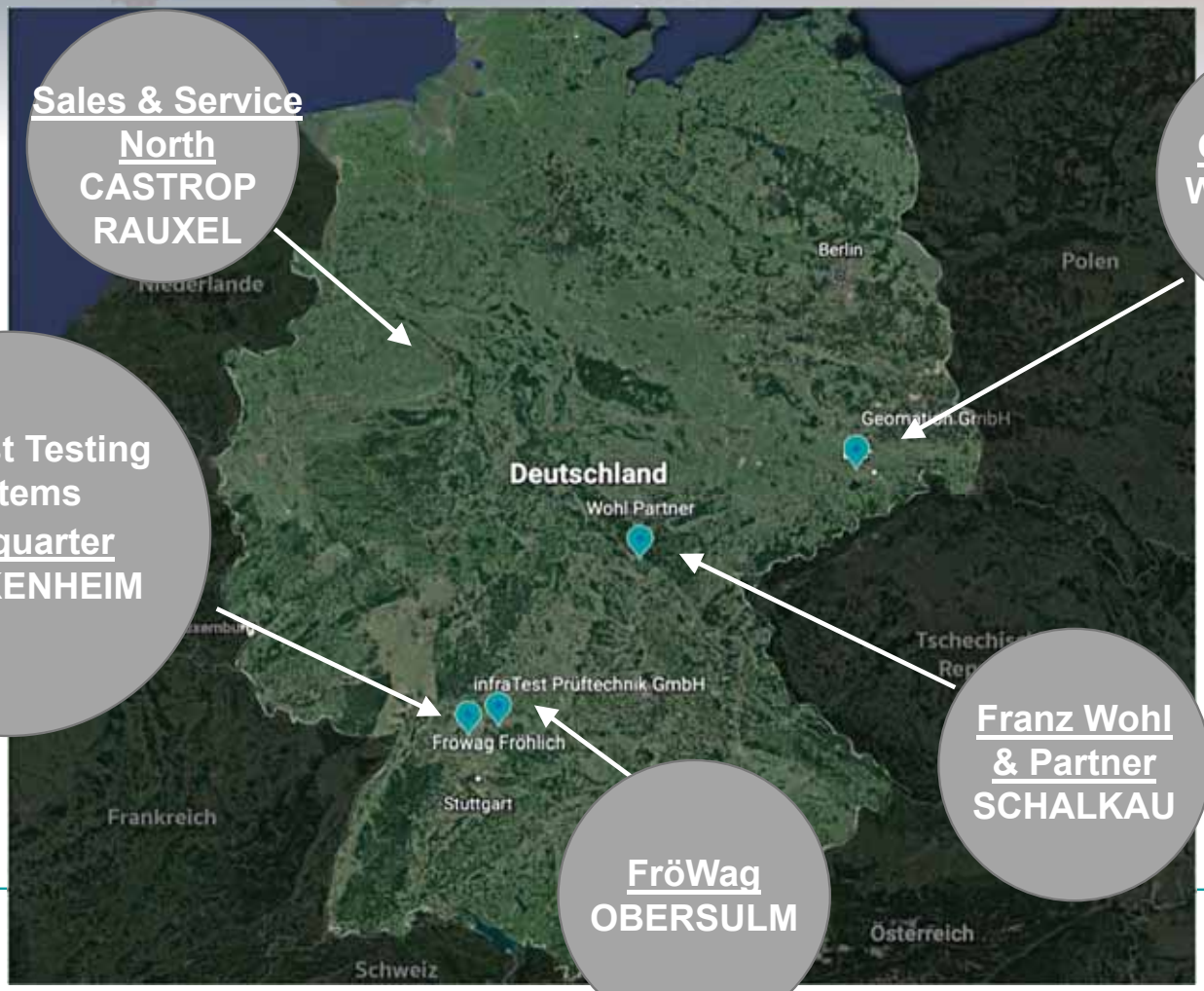
CEO infraTest Prüftechnik

Ersun Görener

CEO infraTest digital solutions

infraTest



Sales & Service
North
CASTROP RAUXEL

Geomation
WILSDRUFF

infraTest Testing Systems
Headquarter
BRACKENHEIM

Franz Wohl & Partner
SCHALKAU

FröWag
OBERSULM

infraTest Facts

most copied company in the market

leader in precision and accuracy

leader in innovation

Very innovative company

20 design engineers

14 % of the workforce is doing research and development

Accuracy/Precision

Imprecise/Accurate

Precise/Inaccurate

Imprecise/Inaccurate

Precise/Accurate

In On and Around the pavement

Road Core Drill ELECTRIC

- Environmentally friendly
- Resource-friendly
- Independence from fossil fuels
- 2 to 3 working days without recharging
- 2 Accumulator packs
- Silent
- Lightweight design
- No trailer driving licence necessary

Road Core Drill ELECTRIC

Road Core Drill ELECTRIC

CASE STUDY:

We drilled 10 cores up to 250 mm yesterday at -11°C. Battery charge level 68% afterwards.

#ELECTRICPOWERDEVICE

SMART DRILL CORE

Sensor Technology

TEMPERATURE MONITORING

→ The essential value in the asphalt technology

Monitoring and collecting temperature data in the asphalt layer

Special sensors which have integrated

- Temperature measuring system
- Sensors measure and save the temperature in the integrated data memory

Sensors are placed during the paving

- Robust, resists high temperature and compaction energy

Data has to be read out in place

- Depending on the location of the sensors, it may be necessary to close off traffic.

Monitoring and collecting temperature data in the asphalt layer

- Independently measurement at defined time intervals of the temperature in the road
- Measurement interval can be changed
- Internal data storage
- Programming and configuration also possible after installation (wireless)

Monitoring and collecting temperature data in the asphalt layer

SOURCE:
TPA GmbH

Monitoring of the temperature and displaying on a Dashboard

→ 24/7 online monitoring and saving of data during life time

The idea

- There are a lot of existing roads
- A completely wireless and self-sufficient system
- Online 24/7 displayed on the idsDashboard
- **We need an intelligent drill core with inbuilt sensor technology**

Intelligent drill core - idsCoreInterface

- Latest state of the art radio technology
- Sustainable, as it is rechargeable and reusable
- Easy and quick installation

Intelligent drill core - idsCoreInterface

Diameter 6 cm / Length 27 cm
Constant temperature monitoring at:

- - 1cm
- - 5 cm
- - 10 cm
- - 15 cm
- - 20 cm
- - 25 Cm

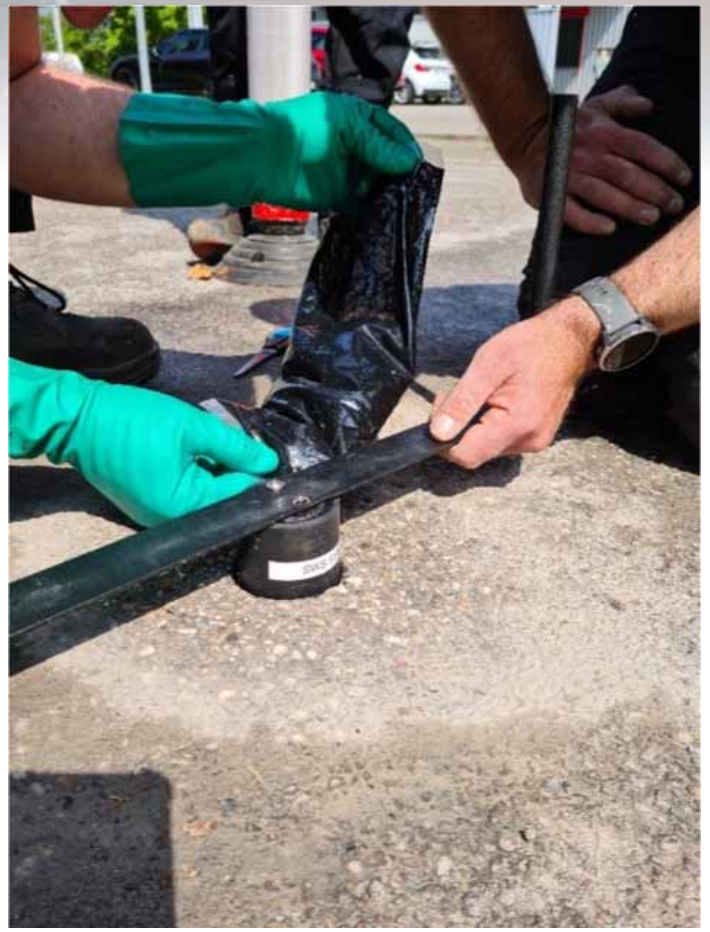
idsCoreInterface

The existing asphalt is drilled using a

Road Core drilling machine (70 mm)

idsCoreInterface

The intelligent drill core is placed into the drill hole.



idsCoreInterface

Backfilling with

a special resin

idsCoreInterface

How it looks like

How does the installation work

- Case Study Münster 28.10.2022

- Datenbasierte Bewertung der Resilienz kommunaler Straßeninfrastruktur – DaRk
- Seit Data-based assessment of the resilience of municipal road infrastructure
- Installation of 2 intelligent idsCoreInterfaces

Bundesministerium für Digitales und Verkehr

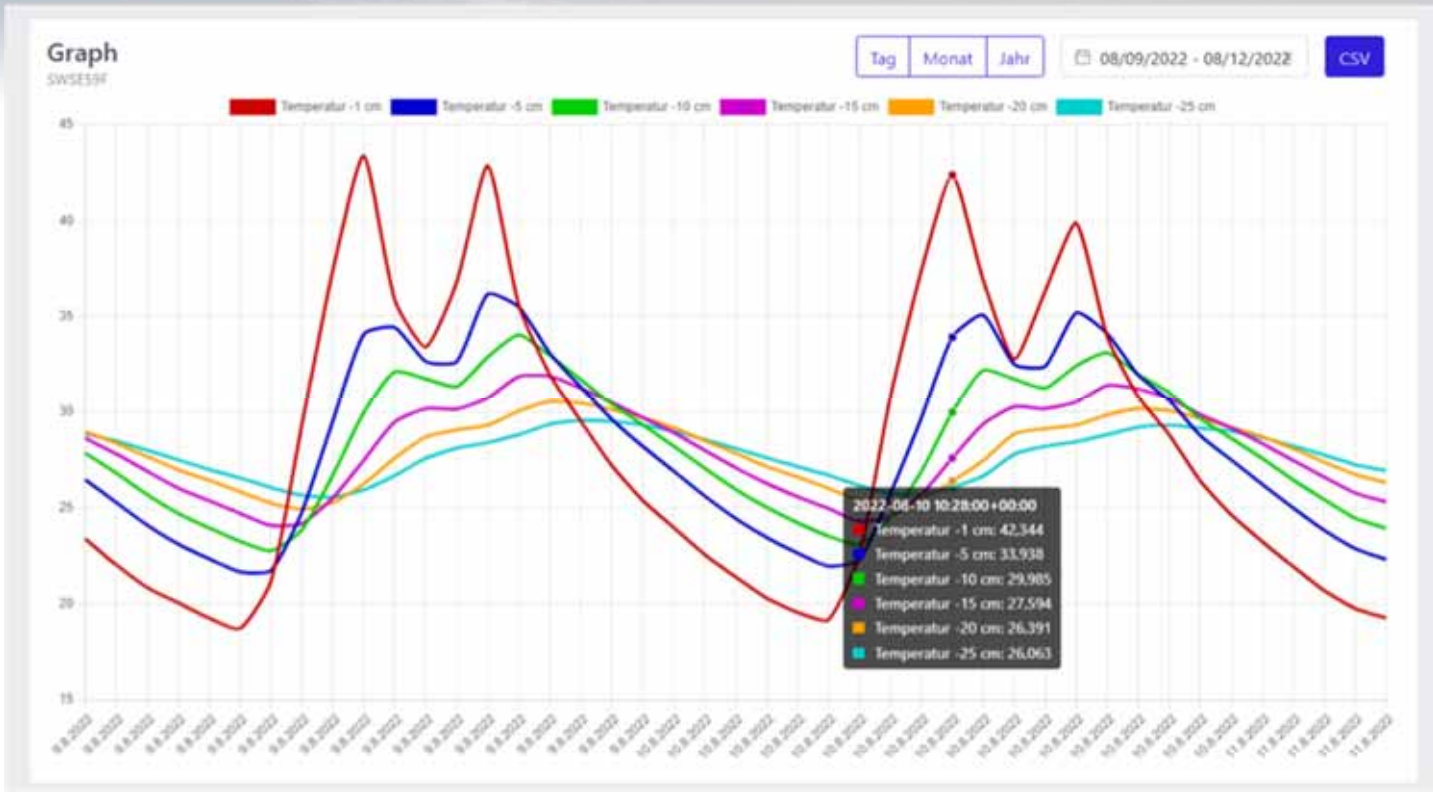
idsCoreInterface

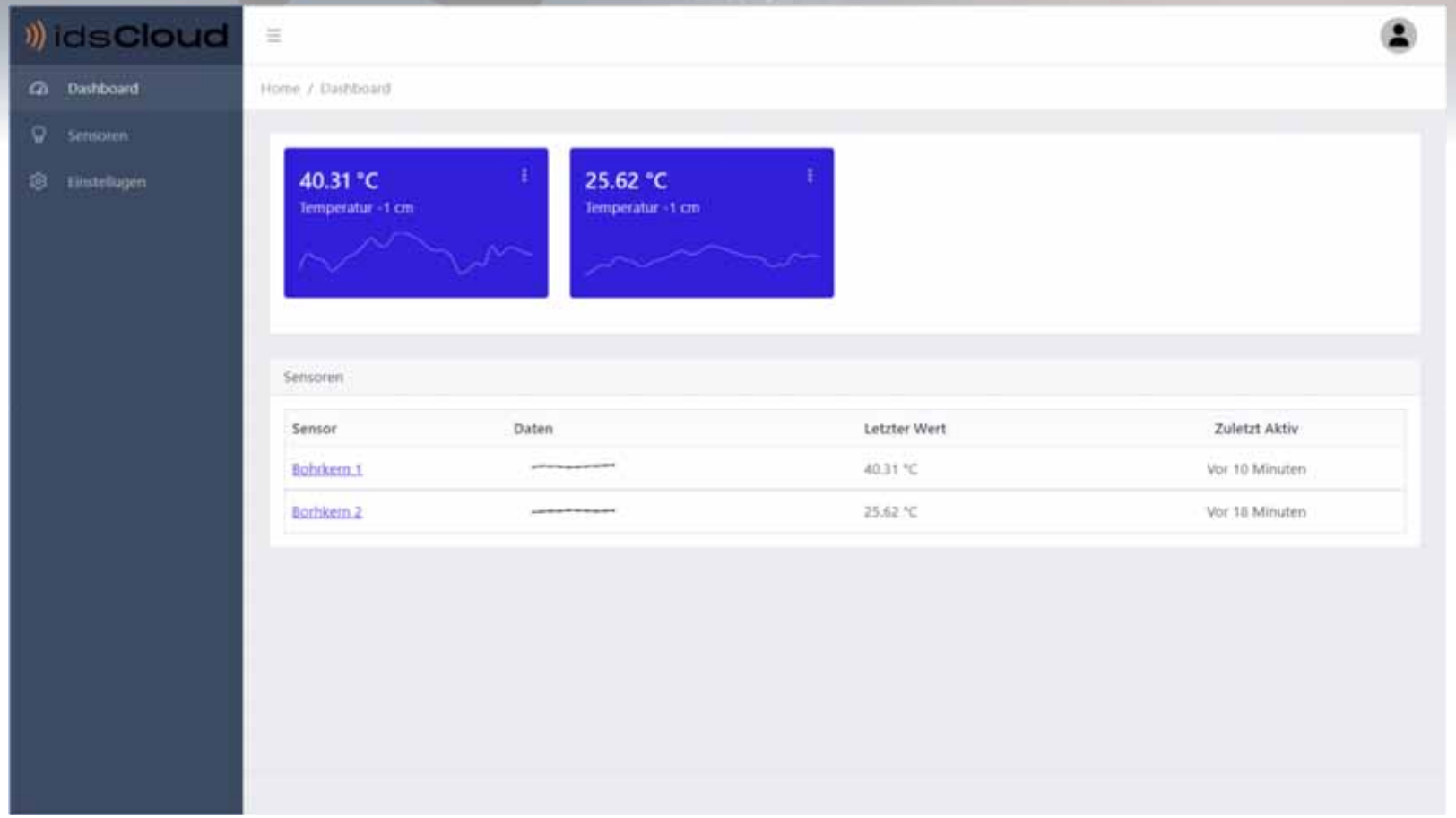
WIRELESS DATA TRANSMISSION

Maximum distance between Sensor and Gateway:
-Up to 15 km in open area
-Up to 2 km in cities

idsCoreInterface

Data transmitted wireless to the idsCloud and displayed on the idsDashboard




idsCloud
Dashboard
Sensoren
Einstellugen
Home / Dashboard
40.31 °C
Temperatur -1 cm
25.62 °C
Temperatur -1 cm
Sensoren
Sensor
Daten
Letzter Wert
Zuletzt Aktiv
Bohrkern 1
40.31 °C
Vor 10 Minuten
Borhkern 2
25.62 °C
Vor 18 Minuten


Home / Graph
idsCore 1 (Brackenheim)
Tag
Monat
Jahr
08.08.2022 - 14.08.2022
CSV

SMART ANALYSIS

Drill Core V-Unit

Project study for the automated acquisition of drill cores and measurement of the layer composite

Drill Core V-Unit

Situation

Drill cores are collected and tested to evaluate the void content, the degree of compaction, the layer thickness, the layer bond and and and…

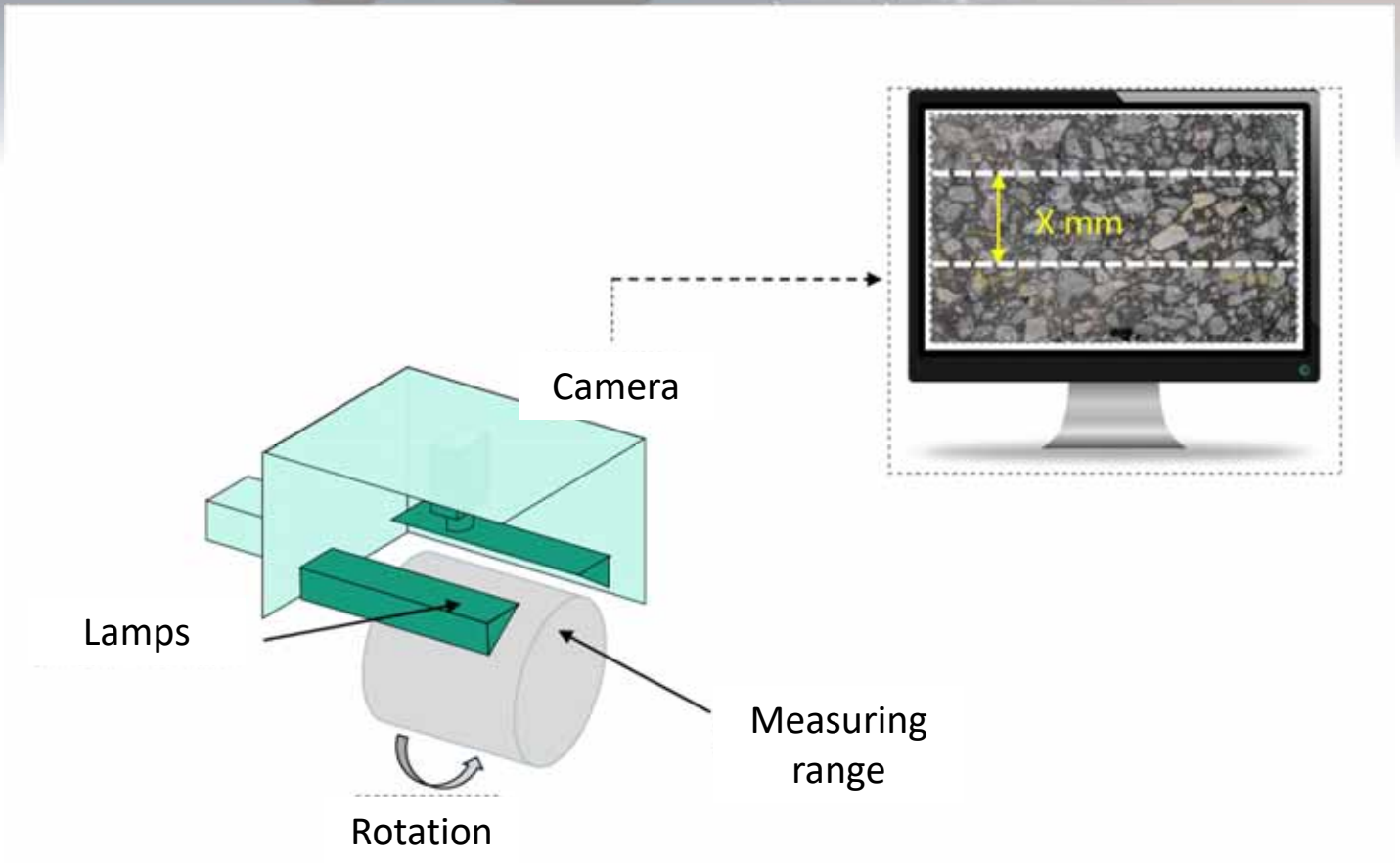
Drill Core V-Unit

Asphalt quality testing

Register drill core and test preparation	2 min.	
Mark the mantle surface at the layer boundaries	1 min.	
Photograph the drill core	1 min.	
Manually measure the layer thickness with a metal ruler or caliper gauge	1,5 min.	
Documentation on paper	0,5 min.	
Transfer to software	1 min.	
Transfer images into the system, rename and post-process them	3 min.	
Check data for transfer errors and image quality	1,5 min.	

Total: 12 min.

Drill Core V-Unit



Drill Core V-Unit

Project goals

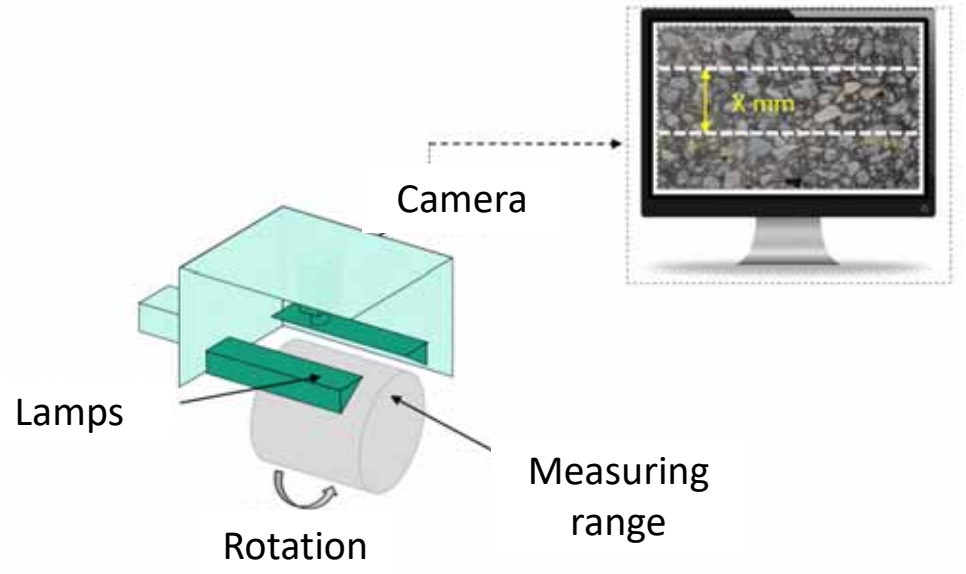
Make results visible and underpin confidence in the results

Avoid transmission errors

Direct linking of data and images

Uniform output of data for processing in other programmes

AND: SAFE TIME



Drill Core V-Unit

Key data

Recording of all key figures of the test procedure Test data

Complete coverage of the shell surface (rotation of the core)

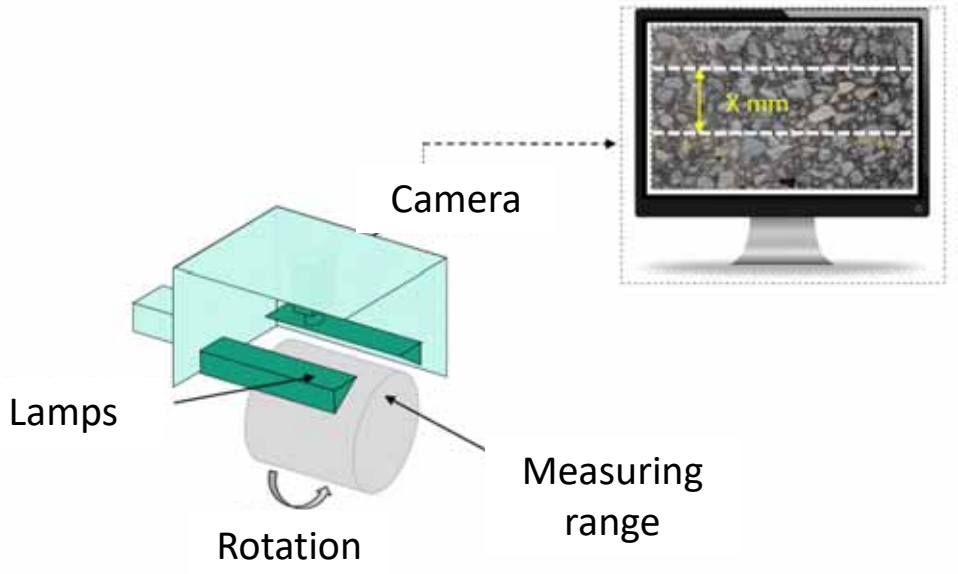
Automatic optical measurement of the layer thickness (up to 0.5 mm)

Output of the measured thickness per layer

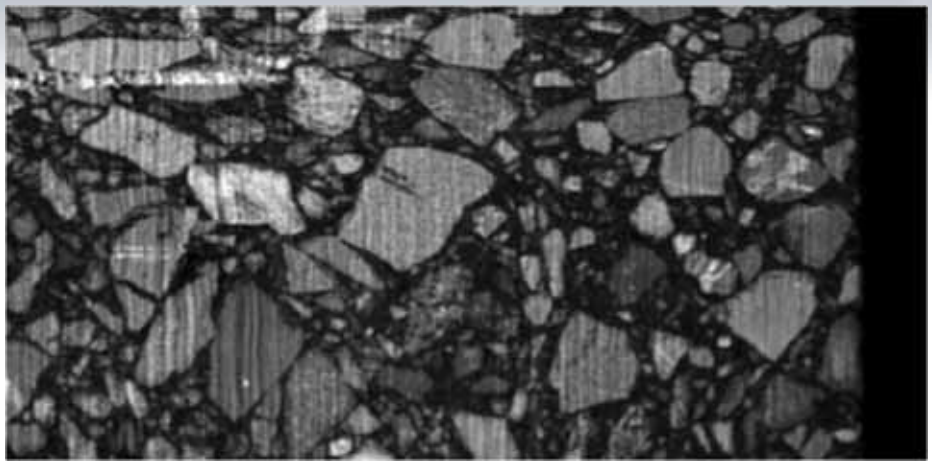
Recording of the image data

Linking of the measured data with the information of the test procedure

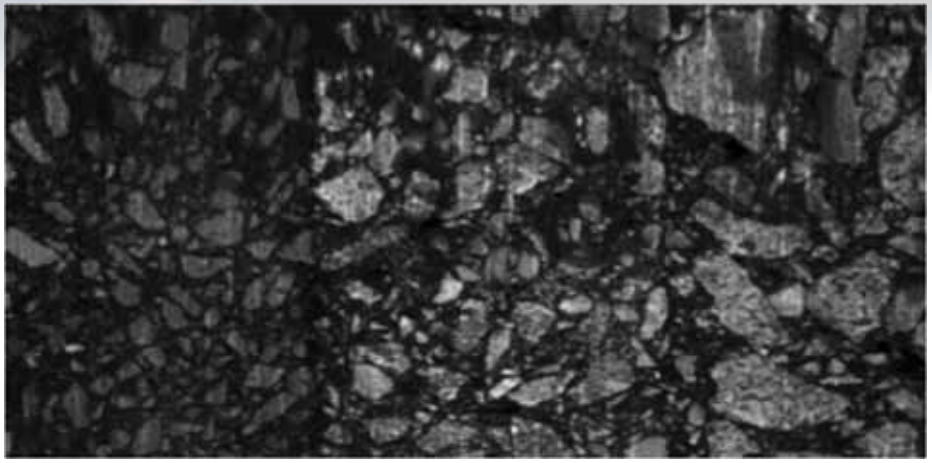
Export to industry standard software formats (LASTRADA, OKSTRA)



Images with normal camera system



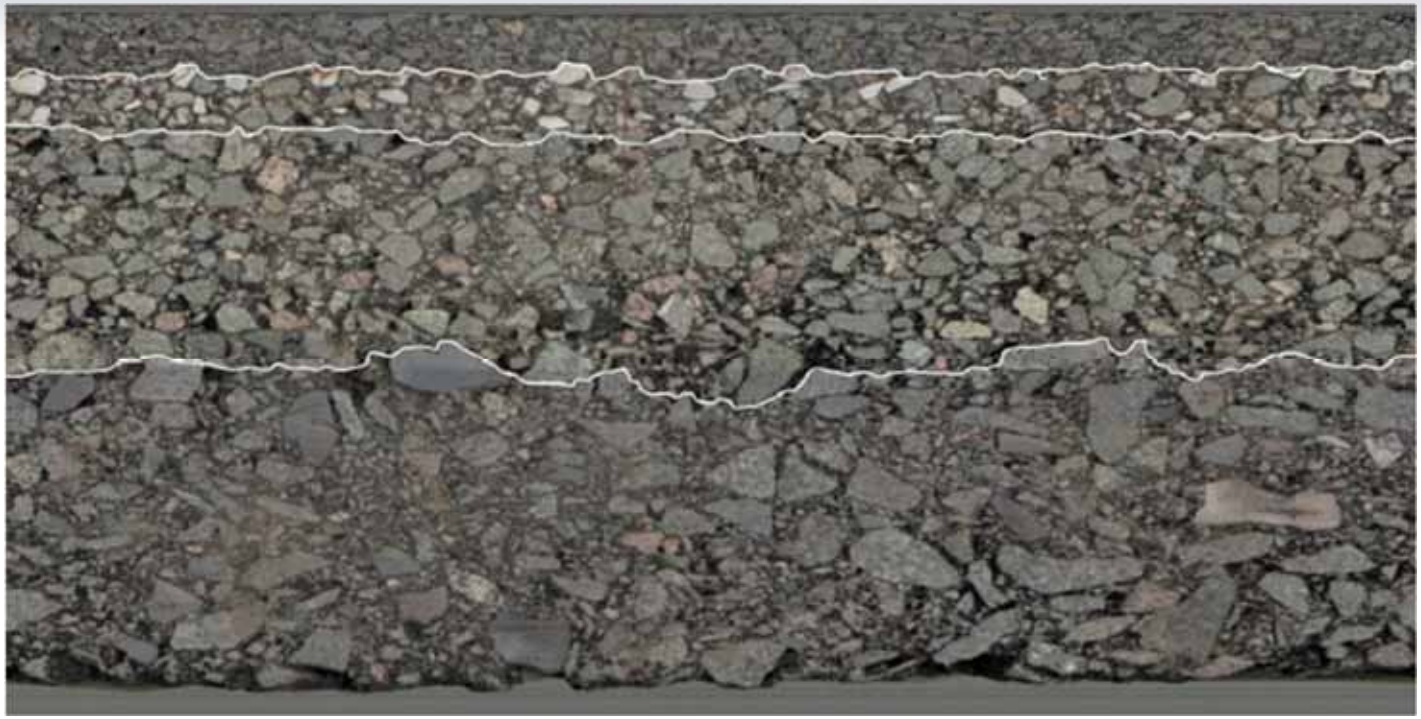
Drill Core 150 mm



Drill Core 300 mm

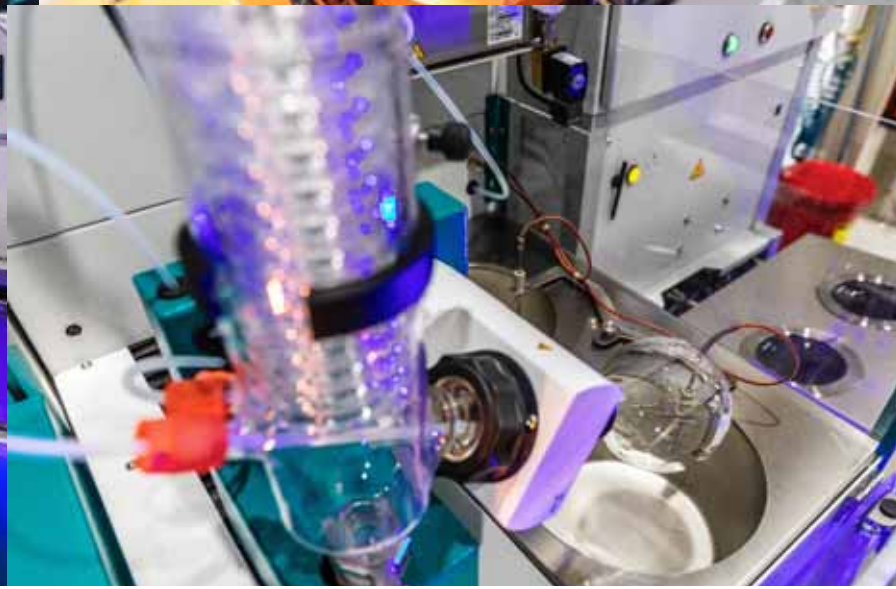
Drill Core V-Unit

Drill Core V-Unit



Drill Core V-Unit

Asphalt Analyzer PURE



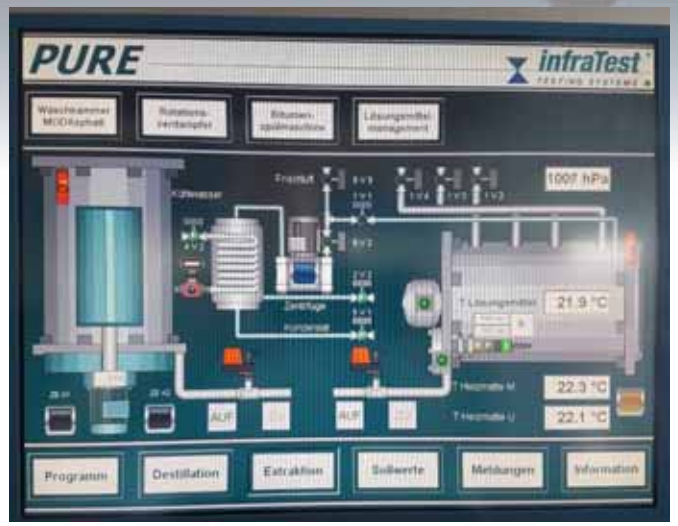
Work flow analysis and automation

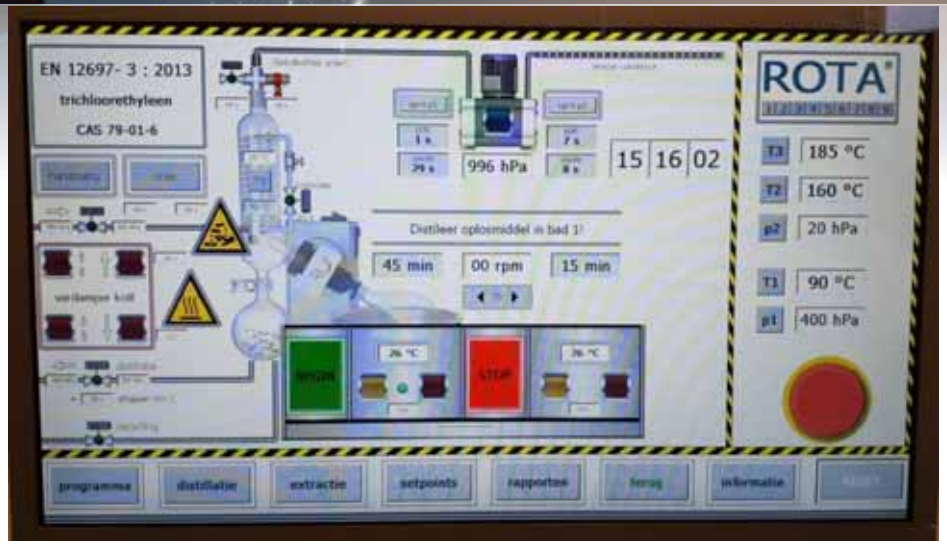
Asphalt Analyzer PURE

Automatic Extractor

Work flow analysis and automation

Process flow: linking and visualization





Work flow analysis and automation

- Extraction with handling robot:

Work flow analysis and automation

Extraction Rotary Evaporator DSR

Kittchen Isle solution

Extraction Rotary Evaporator DSR

1. Step:

Extraction isle

=

Short distances

2. Step

Automation:

From

ROTA

To

DSR

WE ARE THE ORIGINAL

InfraTest Adria and InfaTest

infraTest®
TESTING SYSTEMS

NOT PERFECT, BUT FULL OF PASSION –

ON EARTH AND ABOVE