smart-chart Release Notes

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1 smart-chart 10.1.3

1.1 What's new?

- Additional improvements & bug fixes for PELT instruments

1.2 Additional improvements & bug fixes for PELT instruments

- *Standard Management:* Guidewaves no longer disappear when family settings are changed
- *Test Report:* Multiple Guidewaves of one standard are displayed in separate graphs – before they were overlapping in one graph
- *Instrument Management:* All selected organizers are transferred to the instrument - before the last one was neglected
- *Licensing of PELT Robotic instruments:* Robotic licenses can be activated for catalog number 94200 and 94205 using the serial number of the Dual Pulser Receiver

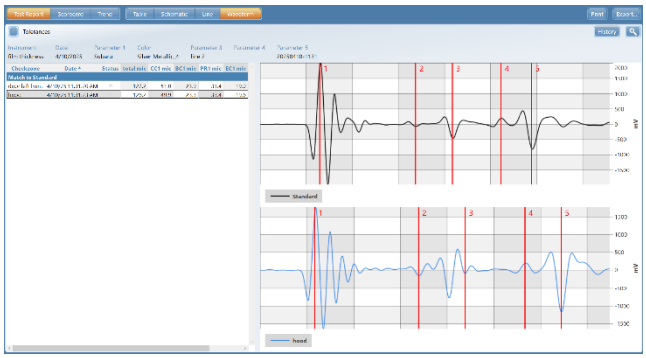
2 smart-chart 10.1.1

2.1 What's new?

- New functions for PELT instruments
  - Waveform and Guidewave are displayed in Test Report
  - Auto Gauge function on the instrument allows showing the film thickness for each layer on the instrument display
  - Multiple Guidewaves per color standard
  - Maximum number of check zones increased to 500
  - "Log off" marked check zones are not saved in smart-chart DB
  - Firmware update included in smart-chart
- New functions BYK-mac i
  - New color equations for Renault: dE REN
  - Pass/Fail mode for test series measured in Difference Mode
- New functions for spectro2profiler
  - Auto Settings for watershed analysis
- New functions for wave-scan Family
  - Selectable scales for x/y axis of Balance Chart
  - Limit bars in Structure Spectrum are removed to improve visibility
- New supported instruments
  - Customer specific wave-scan for Suzuki: wave-scan SZ 3 dual & wave-scan SZ 3
- General modifications
  - New branding with new icon
  - Firmware update for new generation instruments (= instruments with touch display) can be done in Instrument Management
  - SQL database can be hosted in Azure cloud
- Additional improvements & bug fixes
- New firmware for BYK-mac i, color2view, spectro2profiler, micro-wave-scan, micro-wave-scan 3, wave-scan dual, wave-scan 3

2.2 New graph for PELT instruments in Test Report

Test Report has been expanded with a new graph "Waveform". This allows showing the Guidewave of the standards together with the Waveform of a sample. The sample must be highlighted in the data table. The new graph can also be applied to data that were saved with previous smart-chart versions.

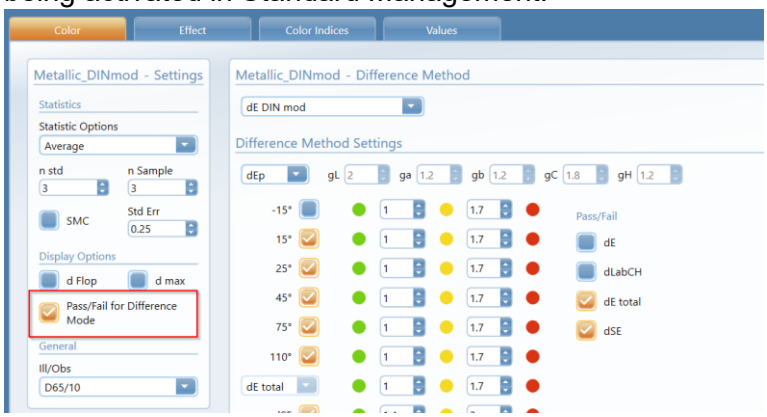


2.3 New color equations for BYK-mac i

After thorough evaluation of existing color equations Renault decided to use dECombined for their new color difference method. It is named **dE REN** as customer specific Pass/Fail limits are used. Starting 2026 digital masters for new color will use the DE REN.

2.4 Pass/Fail mode for test series of BYK-mac i

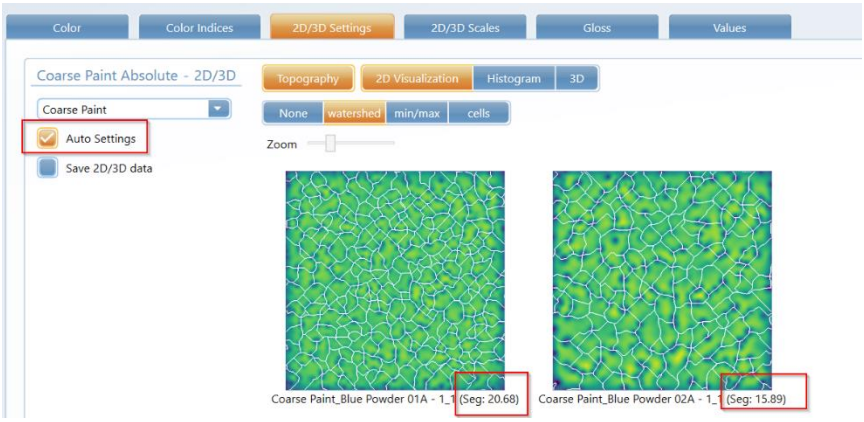
BYK-mac i can now also use Pass/Fail mode for test series measured on the instrument in Difference Mode. The standard needs to be created in smart-chart with Pass/Fail mode being activated in Standard Management.



2.5 Auto Settings for spectro2profiler

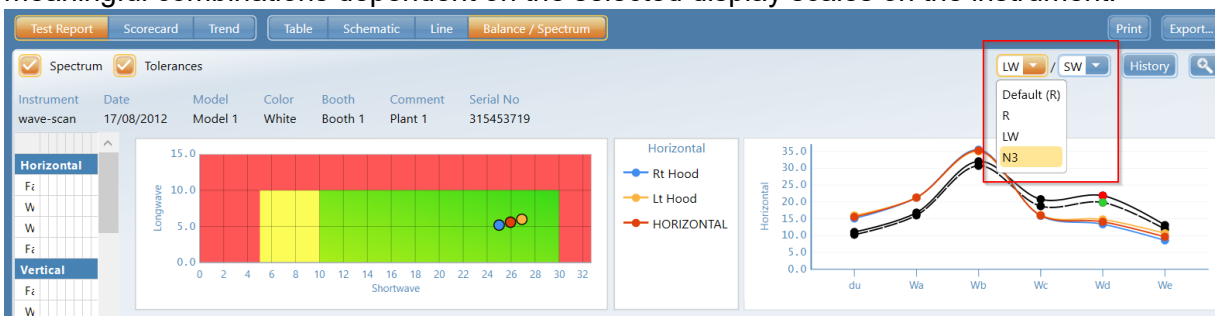
A proprietary calculation automatically determines the Segmentation Parameter based on the 3D topography images. For the Plateau Parameter an empirically determined fixed value is used dependent on the selected algorithm. “Auto Settings” is activated in Standard Management and also applies for the samples that are compared to this standard. This is of benefit when evaluating inhomogeneous samples or when samples with different textures are to be compared.

Auto Settings is also the default setting in the instrument and used in Absolute and Difference Mode as well as in Quick Check.



2.6 Selectable Scales for Balance Chart

The Balance Chart for the wave-scan family offers more flexibility. Before the axes were fixed to chart Wd over B / defined customer scales. Now the x/y axis can be configured with all meaningful combinations dependent on the selected display scales on the instrument.



2.7 Support of wave-scan for Suzuki

After thorough evaluation of the wave-scan instrument with visual comparison studies Suzuki has approved the technology and decided for their own appearance scales:

- Image of Waviness (IoW) ➔ representing Orange Peel/waviness
- Virtual Image Sharpness (VIS) ➔ representing DOI

For Pass/Fail criteria the Suzuki Overall Appearance Quality (SOAQ) is used representing the overall quality rating for the complete car body.
The instrument is available as wave-scan SZ 3 dual and wave-scan SZ 3.

2.8 New smart-chart Branding

Figure 1: New Splash Screen

Figure 2: New Desktop Icon

2.9 Additional improvements & bug fixes

- Firmware update for new generation instruments (instruments with touch display) can be done directly within Instrument Management
- For PELT instruments the “timebase” is now transferred correctly from the instrument to PELT-Manager

- Creating check zones starting or ending with blanks is not allowed for PELT instruments to prevent errors on the instruments
- Print-out: Missing Pass/Fail colors in Data Table is fixed
- Scatter Plot in Test Report for dE FCA, dE BGW, dE SGM, D JLR, SAIC, dE SBR and D NIO is displayed again
- Improved *.asc import
- SQL-database can be hosted in Azure cloud

2.10 New Firmware included with smart-chart 10.1.1

To support the new smart-chart functions also new firmware versions are needed. Additionally, some know bugs are fixed.

BYK-mac i: Version 10.03

- New color equations for Renault (dE REN)
- Pass/Fail mode for test series measured in Difference Mode

color2view: Version 2.4.2.44634

- Bug Fix for Online mode: Settings of loaded standard in smart-lab overrule instrument settings (now also for Jetness mode)

spectro2profiler: Version 1.7.0.45395

- Auto Settings for watershed analysis
- Bug Fix for topography calculation on dark samples: occasionally no image was transferred

micro-wave-scan 3: Version 1.1.0.46569

- Improved differentiation for very low JLR_OP values (JLR_OP < 6 and LW > 30)
- Implementation of additional range for JLR_OP 10 (high quality requirements)
- Measurements on mirror surfaces enabled

wave-scan 3: Version 1.8.0.46312

- Improved differentiation for very low JLR_OP values (JLR_OP < 6 and LW > 30)
- Implementation of additional range for JLR_OP 10 (high quality requirements)
- Measurements on mirror surfaces enabled
- Suzuki specific appearance scales ➔ only available for wave-scan SZ 3 / dual

micro-wave-scan: Version 5.84

- Improved differentiation for very low JLR_OP values (JLR_OP < 6 and LW > 30)
- Implementation of additional range for JLR_OP 10 (high quality requirements)

wave-scan dual: Version 5.84

- Improved differentiation for very low JLR_OP values (JLR_OP < 6 and LW > 30)
- Implementation of additional range for JLR_OP 10 (high quality requirements)

3 smart-chart 9.1.2

3.1 What's new?

- New color equations for BYK-mac i: dE HMC for Hyundai Motor Company and STLA for Stellantis

- New PELT Manager 1.0.50 included
  - Support of transducer 50B
  - Guide-wave is set automatically for auto-gauge during saving in DB
  - Display of expiration date of color-calibrations in Standard Management and warning during transfer to instrument
- Robotic systems:
  - Support of micro-gloss 2 Robotic
  - Automatic data export in ROBOTIC file format for handheld instruments
  - New smart-robotic 4.0.2.40231 with enhanced export functions
- New firmware for micro-wave-scan 3, spectro2guide, color2view, spectro2profiler, BYK-mac i

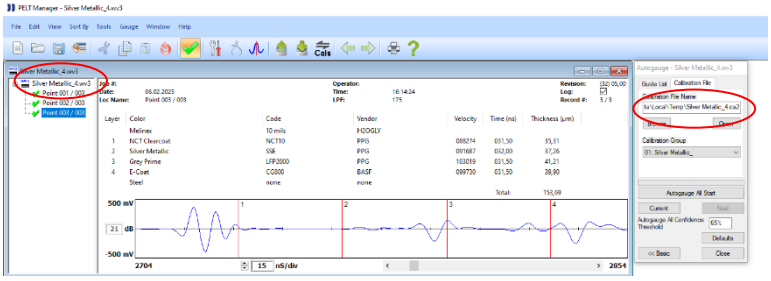
3.2 New color equations for BYK-mac i

After thorough evaluation of color equations with visual comparison studies **Hyundai Motor Company** decided for their own color difference method dE HMC which is based on dEComb2 with a customer specific tolerance factor.

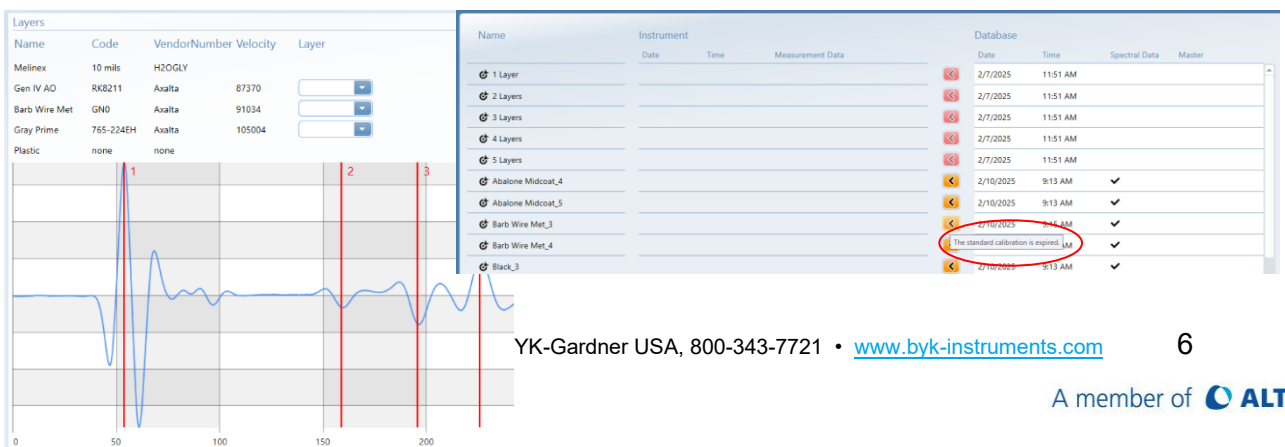
Stellantis Europe will introduce a new color specification using the color difference method STLA. It is using box/pie tolerances that are calculated according to a proprietary equation. A “tendency radio button” decides which direction (±) is to be used. The opposite direction is then automatically filled with constant values for warning and fail tolerances.

3.3 New PELT manager 1.0.50

When conducting auto-gauge during saving of film thickness data into smart-chart database, the guide-wave is now selected automatically. This is true for all newly imported calibration files. Previously imported files are unfortunately missing the required information.



Additionally, the expiration date of the color-calibrations is displayed in Standard Management and a warning using an orange arrow is displayed in Instrument Management when an expired calibration is to be transferred to the gauge.



3.4 Additional improvements & bug fixes

- Scatter-plot was not displayed for the following BYK-mac i tolerance methods: FCA / BGW / SGM / JLR / SAIC / SBR / NIO / DIN6175:2019uw
- BYK-mac i print: coloring of "Fail" color components in data table was missing
- Communication to µPELT was not started when opening license window
- Saving of data from projects in smart-lab into measurement DB was not working
- Due to security reasons print-out was not working on some systems
- Printing of Line Chart for selection "all" (different tolerance groups) was not working
- Message when automatic csv export fails is implemented
- micro-wave-scan 3 firmware-update check fixed: message appeared although no update was available
- Improved search speed for spectro2guide auto-standard function in smart-lab
- Improved saving of spectro2profiler projects to prevent out of memory exceptions on computer with less available RAM

3.5 New Firmware included with smart-chart 9.1.2

To support the new smart-chart functions also new firmware versions are needed. Additionally, some know bugs are fixed.

BYK-mac i: Version 9.99

- New color equations for Hyundai Motor Company (dE HMC) and Stellantis (STLA)

spectro2guide: Version 2.6.0.37995

- Deleting samples:
  - A confirmation message is added when deleting samples
  - Multiple samples can be deleted
- Browse Menu:
  - Cursor arrows to scroll from sample to sample instead of swiping
  - Deletion of individual samples
- Measurement parameters
  - Add “delta option” for dM, dG indices
  - Rename MI to MI_add for additive correction method
- Bugfixes:
  - spectro2go XS: Remove gloss line from calibration/information
  - Remove “aperture mismatch warning” in online mode

color2view: Version 2.4.0.38036

- Deleting samples:
  - A confirmation message is added when deleting samples
  - Multiple samples can be deleted
- Browse Menu:
  - Cursor arrows to scroll from sample to sample instead of swiping
  - Deletion of individual samples
- Measurement parameters:
  - Add “delta option” for dM, dG indices
  - Rename MI to MI_add for additive correction method
- Improved display touch accuracy and shutter is closed immediately after last measurement to reduce contamination of optics
- Bugfixes:
  - Remove “aperture mismatch warning” in online mode
  - Auto diagnosis for Jetness is working again

spectro2profiler: Version 1.6.1.36948

- Deleting samples:
  - A confirmation message is added when deleting samples
  - Multiple samples can be deleted
- Browse Menu:
  - Cursor arrows to scroll from sample to sample instead of swiping
  - Deletion of individual samples
- Bugfixes:
  - Organizer start screen: parameter 3 & 5 can be manually input now
  - Camera Exposure time calculation bug fixed: influence on 3D data of glossy samples only

micro-wave-scan 3: Version 1.0.2.38881

- Bugfixes:
  - Display of DOI, BOI and GM DOI when scan length = 0 is selected

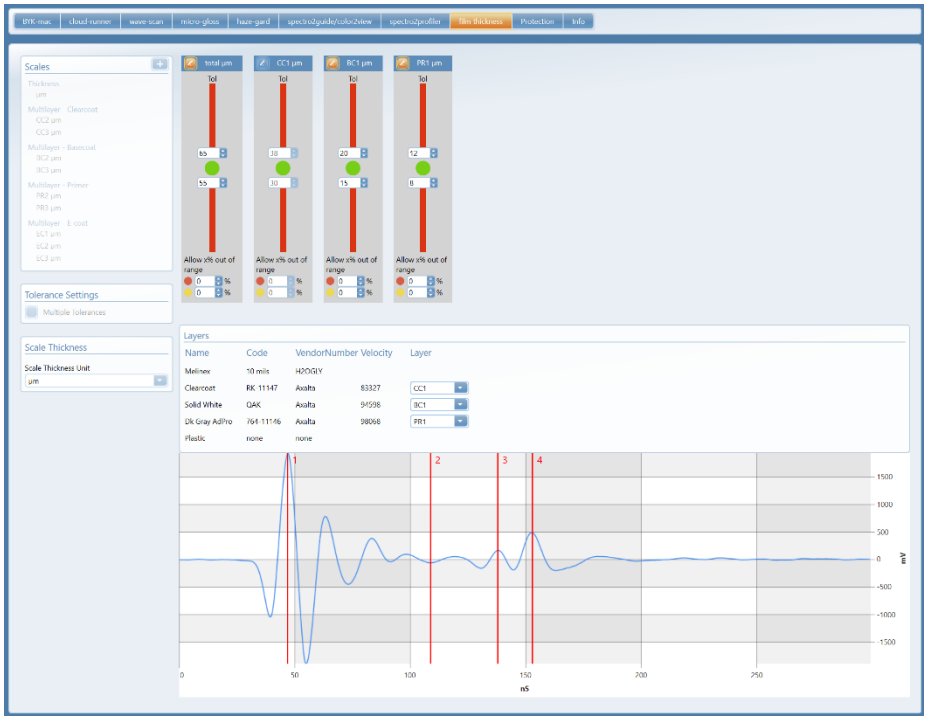
4 smart-chart 9.0.2

4.1 What's new?

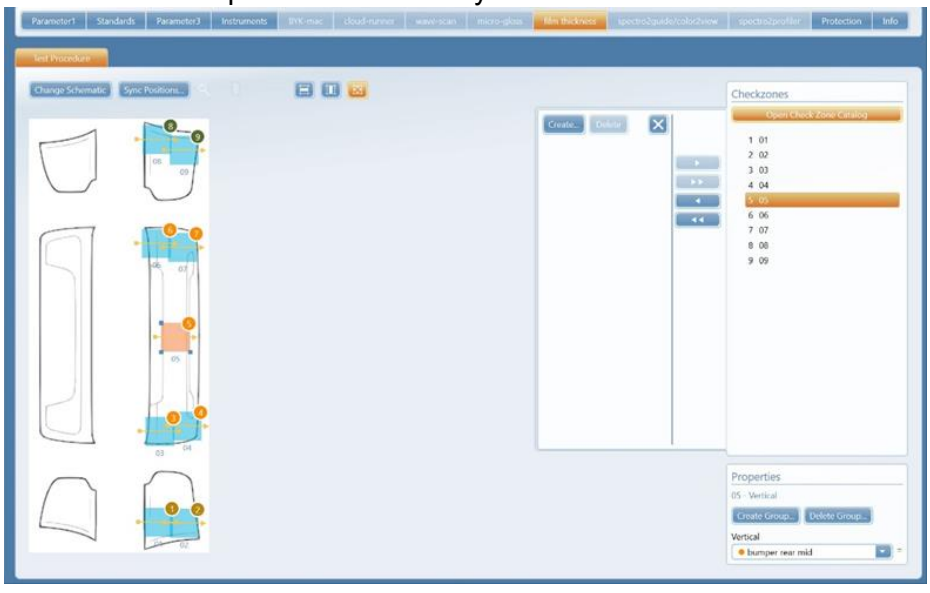
- Support of µPELT-ts
  Compatible with µPELT-ts gauges starting with serial number BP, BQ, BR, BS
- Support of micro-wave-scan 3
- Fixed: After an update for Microsoft Edge print-function is not working

4.2 Support of µPELT-ts

smart-chart offers everything you need to set-up a standardized global QC Management System. In **Standard Management** existing calibration-files including the guide-wave can be directly imported. For each layer the appropriate scales and limits can be defined.

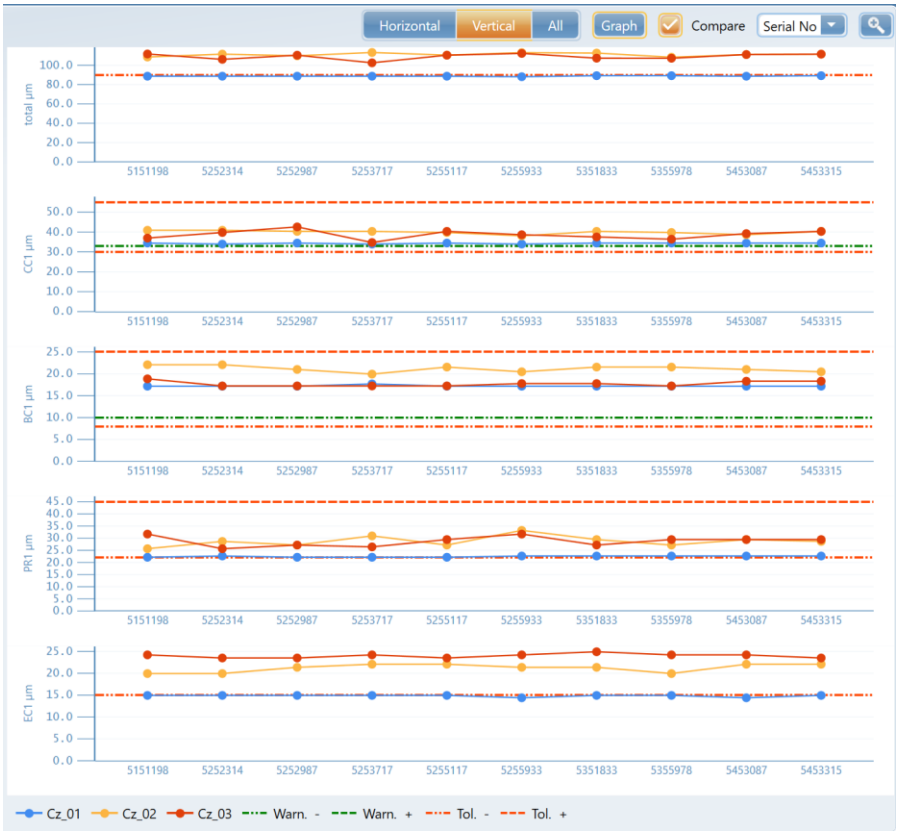


Organizers can be created for clear sample identification and menu guided operation on the instrument. Measurement data is analyzed in **standardized reports**: Test report with history function - SPC reports for trend analysis.



Data analysis in smart-chart offers various possibilities to analyze your collected thickness measurement data for continuous improvement of your products.

- Simple standardized test-reports for e.g. a car can be generated.
- Compare the variation of defined checkzones over time for single layers as well as the total layer thickness.
- Compare areas such as left and right side of your car body to identify the influence of application.
- Compare different material on the same checkzone.



The new smart-chart supports **µPELT-ts** gauges starting with **serial number BQ, BR, BS, BP**. For µPELT-ts gauges 2017 and earlier please use PELT Manager.

4.3 Additional improvements & bug fixes

- Support of micro-wave-scan 3
- Fixed: After an update for Microsoft Edge print-function is not working
- Jetness scale dM can be displayed as absolute and delta value

5 smart-chart 8.6.5

5.1 What's new?

- Acceptance Orange Peel – Indicator of how many people would accept two attached parts in case of Orange Peel.
  Available for: wave-scan 3 family - wave-scan dual / II – micro-wave-scan
- VW trafo for spectro2profiler – existing standards of Volkswagen Group can be imported and used with spectro2profiler.
- Support of new spectro2guide family - spectro2go XS with 5mm aperture
- Increased zoom functionality to zoom even further in general or tables only.
- New firmware for wave-scan 3 family, wave-scan dual / II, micro-wave-scan, spectro2guide, haze-gard i.

5.2 Acceptance Orange Peel – AOP

Acceptance Orange Peel, a measure if a difference in orange-peel between two attached parts is accepted is introduced. The scale was developed by BYK-Gardner and verified by a visual study of Audi.

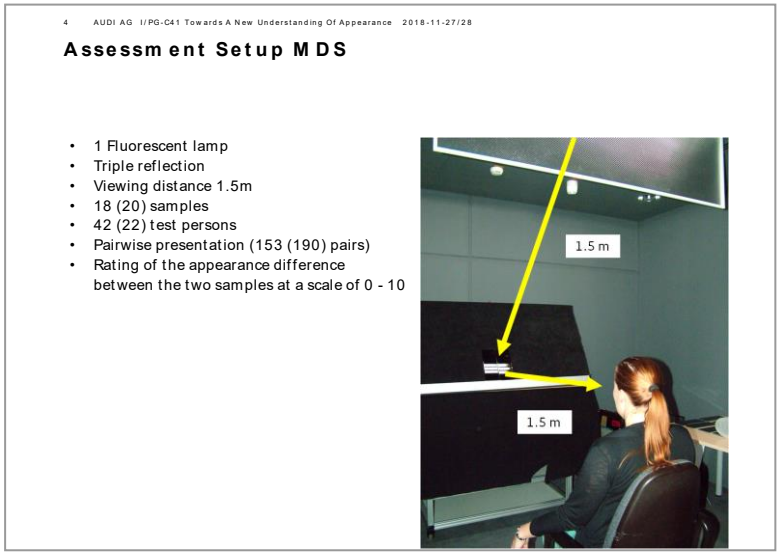


Fig. 01: visual study of orange peel difference

In this study 153 pairs with different leveling have been compared and the probands had to tell if they would accept the difference between or not if present on an automobile. As a result, the pairs can be qualified in percentage of how many persons would accept the combination.

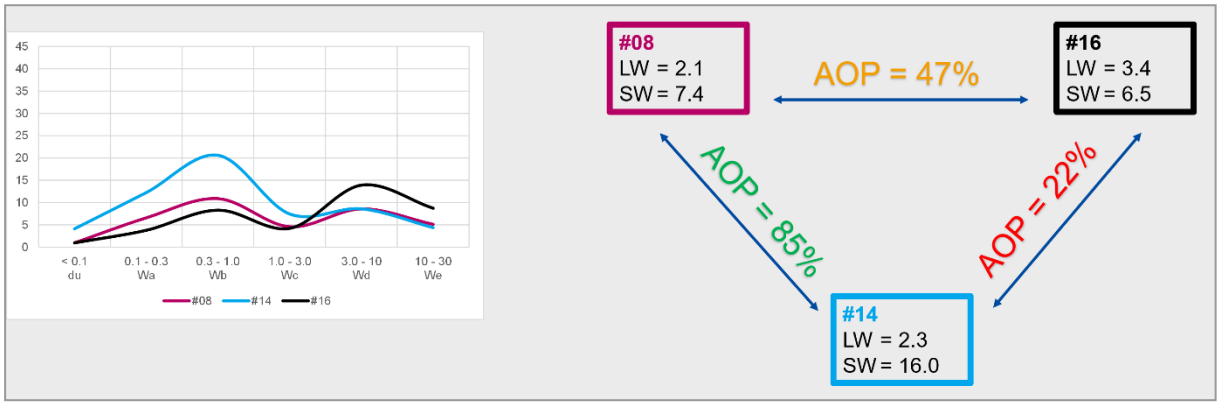
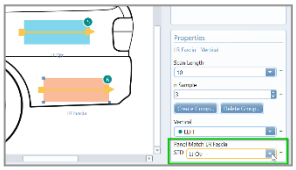


Fig. 02: Acceptance Orange Peel between 3 different panels

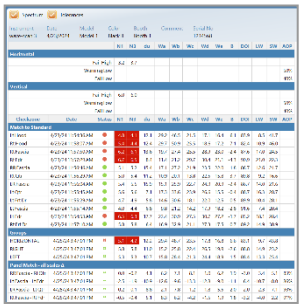
How to set up AOP:

1. By selecting the AOP in *Standard Management*

2. Define panel-match pairs in *Organizer Management*



3. AOP will be calculated once the data is saved into the measurement database.



5.3 VW trafo for spectro2profiler

In *Standard Management* existing interieur standards from Volkswagen Group can be imported. Open the import dialog and select as file type “VW trafo for spectro2profiler”.

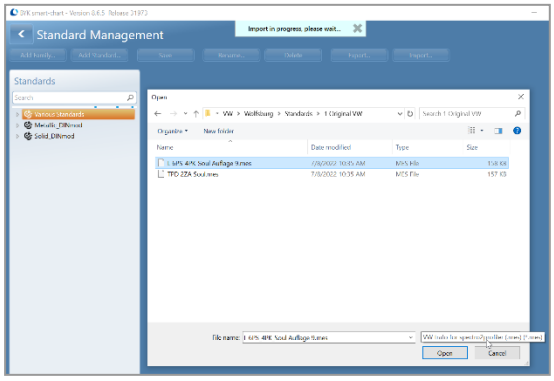


Fig. 03: Import dialog for “VW trafo for spectro2profiler”

Once imported, the standards can be used in smart-lab for spectro2profiler to compare existing measurements against. They cannot be sent to the instrument and online measurement is not possible.

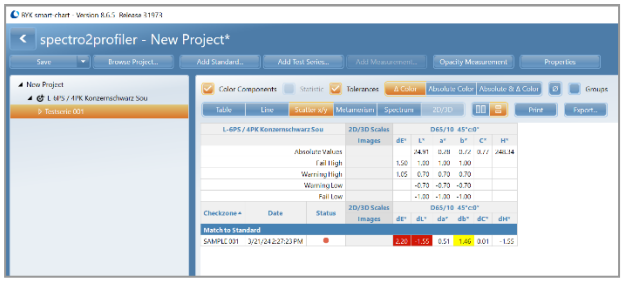


Fig. 04: Use imported standard in smart-lab for spectro2profiler to compare color data

5.4 Additional improvements & bug fixes

- Import of ColorCARE standards with the file extension *.asc implemented. Measurement data and standard name are imported. Tolerances must be set manually in smart-chart.
- Increased zoom possibilities to zoom even further.
- Multiple tolerance groups - fix and optimize advanced options during data transfer.
- BYK-mac i lab: panel match was not recalculated when changing view from weighted to unweighted and vice versa.
- smart-lab for solid color: copy paste of standards was always inactive
- smart-lab for color2view: add measurements to existing standards was not possible
- Imported standards from OnColor were displayed shifted wrongly.
- Update to Microsoft .net8

5.5 New Firmware included with smart-chart 8.6.5

To support the new smart-chart functions, also new firmware versions are needed.

wave-scan 3 family 1.6.0.31843

- support of organizers with acceptance index
- FAM optimization for FAM-values < 5
- Autorotation of display can be deactivated.
- FFT-scales have been calculated though error message was displayed, and no structure spectrum has been calculated.

wave-scan dual / wave-scan II / micro-wave-scan 5.83

- JLR_OP & Changan OP has been calculated though error message was displayed, and no structure spectrum has been calculated.
- FAM optimization for FAM-values < 5

spectro2guide family 2.5.2.30331

- Support spectro2guide XS with 5mm aperture.