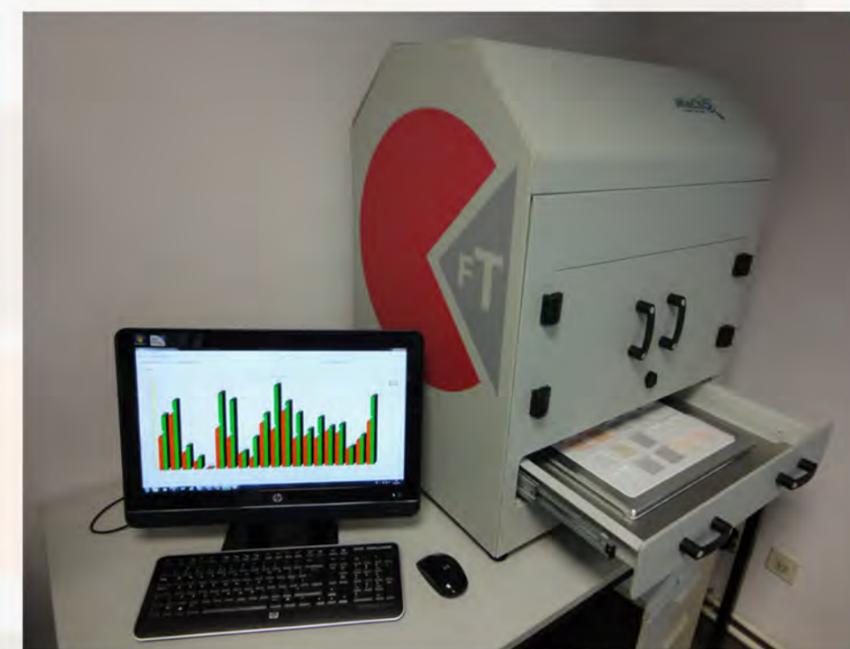


MACH 5

Multi Area Colour-measurement Hardware

For fast, automatic spectral measurements of multiple samples and large, inhomogenous surfaces



Multiple measurements in one go

The MACH 5, Multi Area Colour-measurement Hardware, is the fast and accurate solution for detergent performance measurements. The MACH 5 allows you to perform multiple measurements in one go.

Boost the productivity of your lab

Especially when used in combination with multi-swatch monitors of soiled testmaterials, the MACH 5 streamlines the performance analysis of multiple samples with its one-step measurement cycle. This will significantly boost the productivity and capacity of your lab, while maintaining the accuracy of a spectral approach.

The MACH 5:

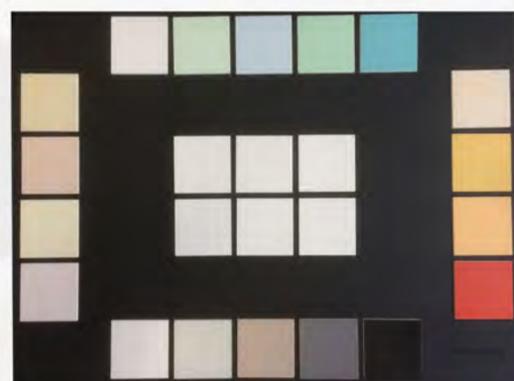
- Measures faster
- Enables quantifying inhomogenous areas
- Ensures fewer human errors
- Measurements are less labour-intensive
- Is specially developed for detergent industry
- Is easy to operate
- Saves costs & time
- Stores picture of every measurement



DELIVERY

The MACH 5 is delivered as a plug and play solution which includes:

- MACH 5
- PC
- Monitor
- Keyboard
- Mouse
- Connection cables
- Frames for placing testmaterials
- Daily Check Calibration Tile
- Protective sleeve for Daily Check Calibration Check Tile
- Calibration Chart



Mach 5 Daily Check Calibration Tile

CO-DEVELOPMENT

The MACH 5 was developed jointly by CFT BV and Colour Consult BV. CFT BV initiated the project and specified the user interface to meet the needs of the detergent market. Colour Consult BV is responsible for the technical design and the actual development of both hard- and software.

Sales and delivery are coordinated by CFT BV. Colour Consult BV handles the technical support.

SERVICE

Continuing support is provided by Colour Consult BV. This support is free of charge for the first year after purchase. After this period you can have to sign a service contract with Colour Consult BV. This will offer you technical service, software updates and the possibility to purchase custom built add-ons (hardware and software), such as a remote-access point for online tech support. This allows Colour Consult BV to modify or update the MACH 5 software remotely if necessary.

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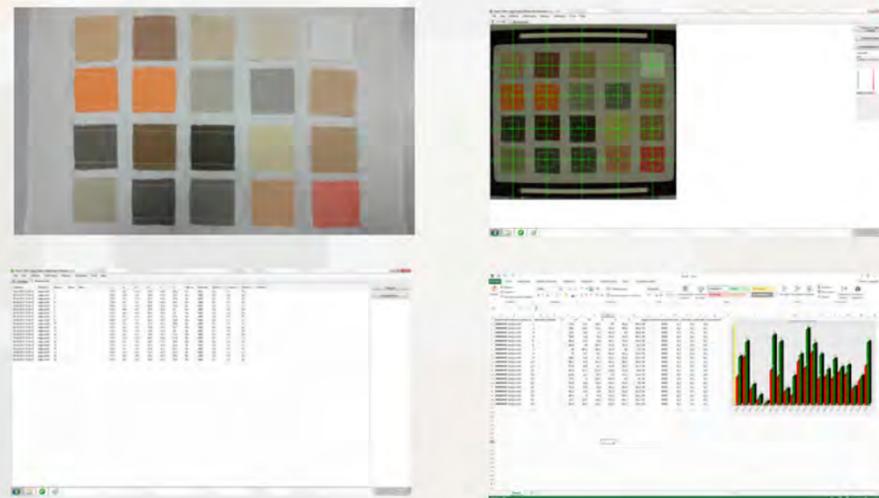


HOW DOES IT WORK?

The MACH 5 combines an industrial photo camera with LED light source technology to create a spectral image. The MACH 5 calculates a spectral image of all selected areas, by analyzing all the images taken in different light spectra

The MACH 5 is especially designed for the detergent industry and works well in combination with multi-swathch monitors. The user can manually select the number and sizes of the areas to be measured. With the push of one button all selected areas are measured and the L*a*b*-values and XYZ-values of all individual areas are calculated. For each area, the software automatically measures multiple smaller subareas to calculate the standard deviation of the stain colour.

The names of the swatches can be retrieved from a stain database and linked to the corresponding areas. The data output can be stored, copy-pasted to e.g. Excel macro's or exported in .csv-files. A database can be populated with this data, including a photographic image of the measured surface.



FLEXIBLE, SMART SOFTWARE

The bespoke software of the MACH 5 offers unique possibilities. Either a flexible, manual selection of areas can be used, or an automated, time-saving selection of areas. In both cases, the variation within the selected areas can be restricted or recorded as a separate value.

All data output can be stored in a database together with the recorded image, which not only offers you unique visual opportunities, but also the possibility to discard the physical monitors.

The data can also be exported to your own analytic software. The user can even add his own complex formulas in Python script which can be run automatically from the MACH 5. The MACH 5 software also comes with a flexible report writer to customize your output.

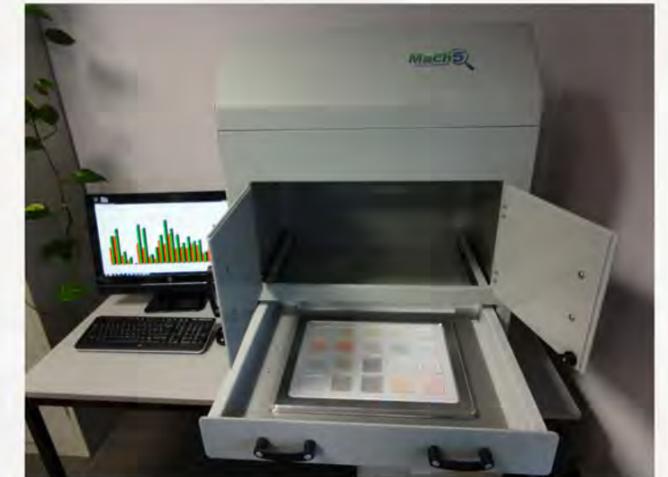
MULTIPLE APPLICATIONS

Multi-Swathch Monitors

The MACH 5 is fully equipped to measure multi-swathch monitors like the CFT SM-04, a monitor with 20 swatches covering the full range of performance contributing components in detergents. Custom configuration of monitors is also possible and becoming more popular. In addition to the multi-swathch monitors, multi-stain monitors are also measurable with the MACH 5, or even a combination of both

'Difficult' Surfaces

A major benefit of the MACH 5 over traditional spectrophotometers is the fully flexible area shape and size selection. This also offers opportunities for instance for dishwasher monitors or tiles, even if the distribution of the (postwash) soil is not homogeneous. By measuring the entire area, average readings can be taken for such samples. The MACH 5 even allows you to quantify testmaterials that are cleaned using the Sheen Washability Tester



TECHNICAL DETAILS

The MACH 5 is equipped with multiple light sources which together cover the spectrum from 400 – 750 nm, corresponding with the colours visible to the human eye.

The combination of the spectral sensitivity of the camera and the selected light sources gives results that are similar to that of a fully equipped spectrophotometer. Since there is no UV-component in the light sources, the MACH 5 gives results like a spectrophotometer with a UV-filter in place (UV excluded). Output is given in L*a*b*-values and XYZ-values. The option to measure on 460nm can be built in on request.

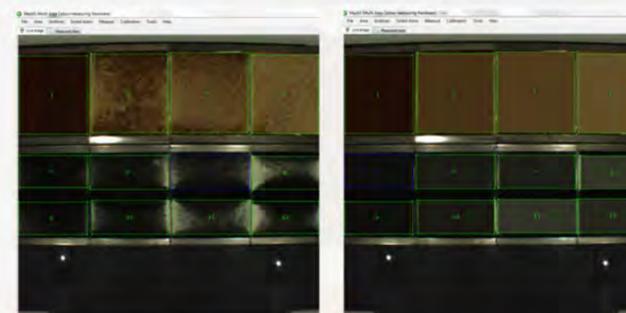
Extensive testing has shown that 97.65% of the L*-values measured with the MACH 5 deviates less than 2 units from a conventional spectrophotometer. The L*-value (or Y-value for that matter) is the most important value to quantify the soil removal. The a*-value and b*-value scored 96.3% and 94.4% respectively in these tests. A detailed report is available on request.

As with every measurement device, the MACH 5 needs to be calibrated periodically. As an option the calibration can be matched to your own spectrophotometer. You can even toggle between different calibration values to match different spectrophotometers in your laboratory.

A Daily Check Calibration Tile is included with the MACH 5. With this tile, that contains 24 different coloured tiles, you can check on a daily basis if the machine works correctly.



DM-tiles with inhomogenous wash results. The MACH 5 can even quantify handdish results.



The figure on the left shows how you can measure the 'difficult' surfaces. The picture on the right shows how the MACH 5 'sees' the average color.

HISTORY

One of the most consuming parts of laundry detergent performance testing is measuring the results. This is commonly done by hand with spectral measurements.

Several years ago CFT BV started the search for a commercially available device that was able to perform multiple spectrophotometric measurements at once to speed up the measurement process. We did not find a solution that fitted our needs in terms of reliability, value for money, accuracy and lifetime.

When we came into contact with Colour Consult BV, a company that custom builds colour measurement solutions, we decided to take matters into our own hands and took the initiative to develop a Multi Area Colour-measurement system.

Initially we sought to develop such a system for our own use. When we noticed that many of our customers had similar needs, we saw the potential to commercialize this system.

Based on the user input from CFT BV, with all her experience as producer and distributor of testmaterials worldwide, the user input of companies who already use the MACH 5 and on the technical expertise of Colour Consult BV, the MACH 5 system now offers greater efficiency and effectiveness in colour measurement.

The MACH 5 is on its way to transform the measurement of swatches in the detergent industry.

