



KONICA MINOLTA



White Paper

# WAVELENGTH ANALYSIS & ADJUSTMENT

## Your next step in accuracy

Your spectrophotometer will perform best when it is kept in optimal shape. Although the electronic components inside will always vary slightly in performance, taking care of the device according to the user manual will limit the impact of this variation. This way, with each measurement you can rely on the colour values that the device shows you. When still in doubt, you could make use of a Green Tile check to confirm that everything is within tolerance. That should be enough, right? Or could you do better?

This white paper explains you why Konica Minolta Sensing introduced Wavelength Analysis & Adjustment (WAA) in their latest products and how you can benefit from it. You will learn about the different methods that are available to ensure that your instruments work correctly, as well as how WAA further builds upon this.



## Calibration

Daily calibration is your very first gateway to obtaining accurate measurements.

There are two different kinds of calibration: zero calibration and white calibration. Zero calibration determines the lowest level of light that can be sensed. This calibration is required for each spectrophotometer when you switch on the instrument for the very first time. But since the zero level of the sensor is not expected to drift significantly, you will find that the impact of consecutive zero calibrations is negligible. This is why certain models of spectrophotometers allow you to skip the zero calibration.

White calibration linearizes the response of the light sensor for every wavelength interval. The target colour value is linked to a specific white calibration standard. This is why each spectrophotometer always needs to be calibrated with its own standard. When a calibration standard needs to be replaced because of damage, your instrument is also required to be reprogrammed to contain the values of the new standard. The light sensitivity of the sensor changes with temperature as well as due to aging of the electronic components. You will need to regularly redo your white calibration, at least each day when the instrument is used.

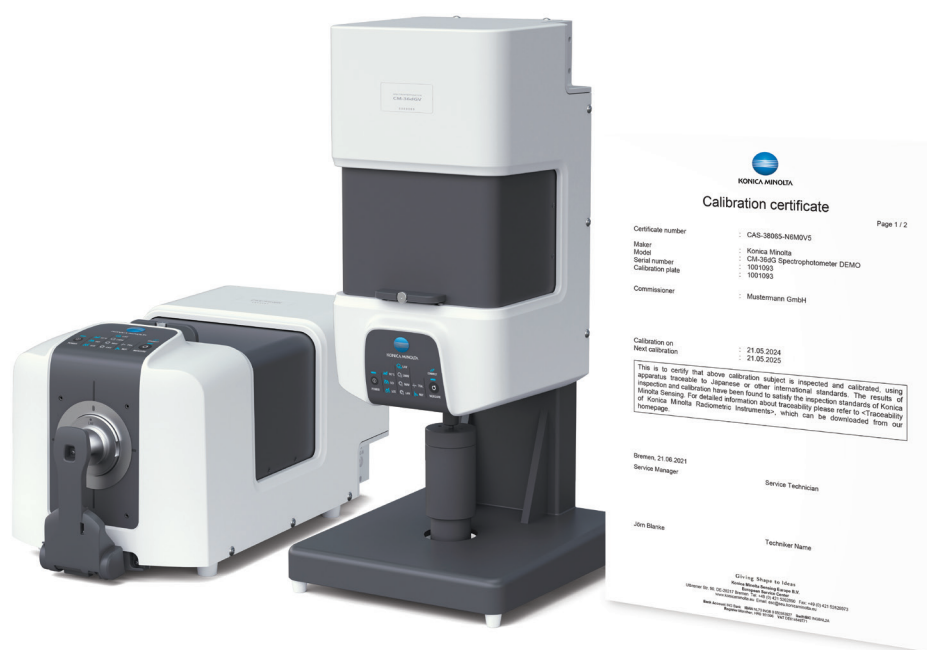


## Maintenance

Just like with your car, a yearly maintenance for your colour measurement instrument will strongly benefit your device.

During the yearly maintenance, the instrument and white calibration standard will be checked and cleaned. This prolongs the life of the spectrophotometer. In case certain components are reaching the limits of their performance, they will be replaced before drifting out-of-tolerance.

Our Konica Minolta service engineers also take care of recalibration of your white standard. During the calibration a strict procedure is followed that compares your instrument with the “Konica Minolta standard”. This in turn has been calibrated against recognised International Standards. Any deviation, no matter how small, is corrected and the results are entered on a calibration certificate. The procedures followed are recorded on the certificate along with a diagram illustrating the traceability to International Standards. An official label with the calibration date is applied to your instrument and Konica Minolta will inform you when the next calibration is required.





## Wavelength shifts

As explained, your daily white calibration corrects for any change in sensitivity of the sensor. However, temperature variations and mechanical stresses may also cause a change in the alignment of the optical elements. Consequently, a slight difference may exist between the actual wavelengths of the reflected light from your sample and the measured wavelength as sensed by the spectrophotometer. In practice, this would mean that your sample measurement is every so lightly too bluish in case of a shift to the shorter wavelengths, or too reddish in case of a shift to the longer wavelengths.

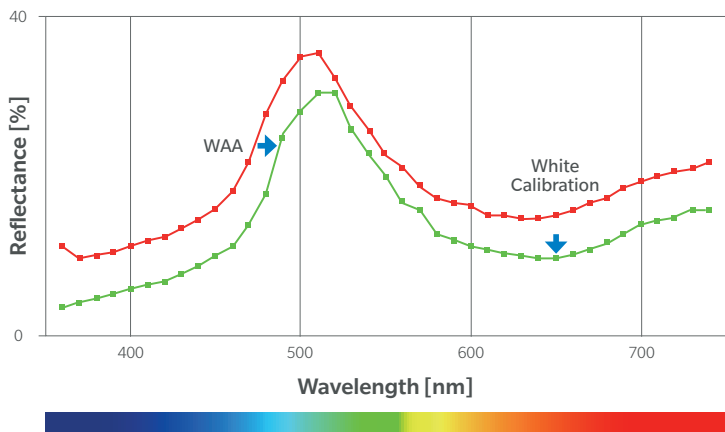


The yearly maintenance will make sure that this alignment is corrected with every service inspection. But in between maintenances you may also want to check and confirm that the accuracy is still OK. Historically, owners test this by measuring a uniform green tile. The colour of such a tile is stable over time and the tile itself does not easily wear. Furthermore, the spectrum of green contains a steep slope. The position of this slope can be tracked to easily detect a wavelength shift. By regularly measuring the green tile, users can compare the measured spectrum over time and see if any shift has occurred.



## Automatic Wavelength Analysis & Adjustment

The automatic Wavelength Analysis & Adjustment (WAA) takes away the need for the green tile check. WAA is Konica Minolta's proprietary technology to take away the need of manually checking the performance of your colour measurement devices. In your WAA-equipped spectrophotometer, a dedicated light source is used with a well-defined spectral signature. During your regular white calibration, the instrument will use this light source to detect if all optical components are still aligned correctly. If not, a slight wavelength shift will be detected which will be corrected automatically by the instrument. This correction will be applied to all consecutive measurements until the next calibration.



In case an excessive shift is detected which can not be corrected, the operator will receive a warning. The spectrophotometer will need to be checked and recalibrated by a Konica Minolta Sensing technician to make sure that the accuracy of your measurements is guaranteed.



## Instruments with WAA

Currently Konica Minolta Sensing offers two series of spectrophotometers with WAA: the benchtop series CM-36d(g)(V) and the portable series CM-16d/17d.

In both cases you may see an orange glow coming from the measurement port of the instrument during calibration. This is the WAA light source being activated. Access to WAA requires a dedicated license that will be activated and extended with your yearly service plan.

In case of the CM-36d, the WAA will take approximately 20 seconds during the white calibration. WAA will be activated through the service centre when you purchase your instrument together with a yearly service plan.



For your portable CM-16d/17d, WAA will only take an extra 5 seconds for your calibration to complete. You will receive one year of free WAA with the purchase of your instrument. By choosing the yearly service plan, your WAA license will be extended by 12 months with every service visit without additional costs.

Spectrophotometers with WAA



## Summary

**WAA automatically checks and corrects for small deviations in your spectrophotometer.**

This removes the need for manually performing green tile checks and ensures that your instrument performs optimally in between service and maintenance. If you choose for a yearly service plan, you will automatically get WAA included without additional costs. By using a WAA equipped spectrophotometer, you can be reassured that each measurement is always within the tightest tolerances.