



# Color management solutions for the cosmetics industry

**How do you choose a measurement instrument?**





Before selecting a colorimetric measurement solution it is good to ask the right questions. By answering these questions, you can orient your choice towards a specific measurement device model.

*The choice of a measurement device will depend on 4 major criteria:*

- 1. The samples to be measured**
- 2. Standards and recommendations**
- 3. The function of the device in the company**
- 4. The investment budget**

Measuring, controlling and formulating the appearance of cosmetic products are a real industrial challenge and a genuine problem.

It is necessary to select a technology that is suited to the nature of the measured products and the type of information sought: color, appearance, brilliance and effects.

The measurement must then be made representative of the pursued goal and a choice must be made between measurements of the mass, after application or using a combination of these.

The measurement must be made meaningful, i.e. the preparation and presentation of the sample must be adapted to the measurement. It is then necessary to design a sample carrier and reflect on the implementation of the overall item.

This reflection is mandatory before being able to industrialize processes and establish methods for characterizing and accepting color and appearance.

### LIPSTICK

Lipstick is a product that is often opaque in mass but which can be transparent, translucent or opaque after application. It is colored by pigments or colorings, with a high degree of brilliance, using traditional coloring substances or pigments with effects (variation in the color depending on the angle of observation).

Verifying the appearance of this type of product is complex, because it is difficult to measure the brilliance and texture.

*Color control can be performed in 3 ways and represent 3 states:*

- The grape color: corresponding to the most important aspect, because this is the one that defines the visual aspect of the product during purchasing
- The mass color: corresponding to the color of the product without the influence of brilliance
- The color after application: corresponding to the very important aspect of the color once it is applied to the lips, and therefore during use.

### FOUNDATION CREAM

Foundation cream is an opaque mass product, but which can be considered as translucent after application. It is colored by traditional mineral pigments (titanium oxides, ferrous oxides, carbon black, ultramarine blue). The appearance of this type of product can only be verified after application.

*Color control takes place in 2 ways:*

- The mass color corresponding to the color of the product in its packaging
- The color after application corresponding to the product applied to a support.

### POWDER

Powders can be presented in free or compact form.

*Free powders can be verified in 2 ways:*

- The color of the free powder corresponding to the customer's 1st judgment
- The color after application corresponding to the use of the powder on a support.

*Compacted powders can be verified in 3 ways:*

- The color of the free powder representing an intermediate state
- The color of the compacted powder corresponding to the customer's 1st judgment
- The color on application corresponding to use of the powder on a support.

### NAIL VARNISH

Nail varnishes whose purpose is to deposit a colored film on nails can be transparent, translucent or totally opaque while also using coloring substances with effects.

*Nail varnishes can be verified in 2 ways:*

- The color of the mass product: corresponding to the customer's 1st judgment but also to an exclusively light reflection mode
- The color after application: corresponding to an opaque or translucent film, with the contribution of the color of the nail.

### PERFUMES AND LOTIONS

Most of the time perfumes and lotions are colored solutions, which are perfectly transparent and very rarely translucent. The color of perfumes and lotions can only be verified in liquid form and corresponds to the sole judgment of color that we have for these products. Color control allows assurance of color conformity, but also makes it possible to verify other physico-chemical characteristics (concentration, nature, evolution of batches of raw materials, natural or synthetic aromas, etc.).

*Perfumes and lotions can be verified in 2 ways:*

- Verification of the content alone in a specific tub
- Verification of the global appearance of the content in the container.

### PENCILS

Make-up pencils can be classified together with color pencils and the techniques used for color control are very similar.

*Pencils can be verified in 2 ways:*

- The color of the mass product: corresponding to the customer's 1st judgment
- The color after application: corresponding to the color obtained after make-up is applied.

## VS450

### Non-contact spectrophotometer with gloss sensor



#### Cosmetic Applications

Cosmetic products range in material from powders to pastes, all of which are difficult to measure with traditional contact based instruments. Sample presentation methods such as glass barriers often distort the appearance of the material. VS450 eliminates this surface distortion with its unique ability to measure without contact, yielding truer results more representative of what the eye sees.

12mm



6mm

**Dual Aperture Sizes**  
(shown actual size)

#### *Special 'Non-contact I-View':*

This makes it possible to measure foundation creams, nail varnishes, powders, lipsticks, monochromes and other pasty or mass care products directly. The spoons can be manufactured at different depths, with white or black bases as the user chooses.

*The principle is as follows:*

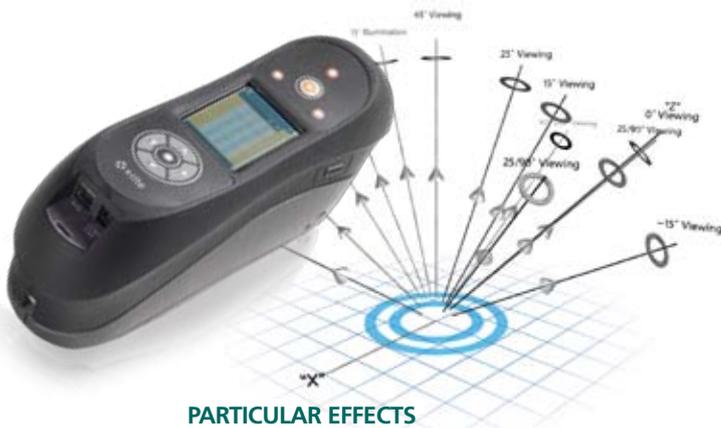
1. A spoon is filled with the product concerned and is leveled with a spatula.
2. The spoon can then be placed in the I-View support.
3. Once positioned, acquisition can then take place in very good conditions for reproducibility.

*Product Features:*

- Non-contact color measurement allows sample measurements from a distance, eliminating surface distortion caused by contact based measurement methods
- Full system LED illumination provides years of reliable performance
- Line of Sight™ visibility to the sample enables technicians to quickly and easily position the sample for measurement
- Active Visual Targeting™ projects a prominent illuminated target ring onto the sample for precise and accurate measurements
- Dual measurement spot sizes, 6mm (1/4") and 12mm (1/2") which can quickly and easily be switched without the need to recalibrate
- Integrated gloss sensor provides 60° correlated gloss values
- Versatile design improves measurement capabilities on two and three dimensional objects
- Best in class color accuracy and repeatability



## MA98 Portable Multi-Angle Spectrophotometer



### PARTICULAR EFFECTS

Cosmetic applications are characterized by their chromatic attributes on the one hand, i.e. tonality, saturation and clarity, but also by their geometrical attributes, brilliance, luster, veiling and flash. As a result, we note a major variation in the proposed effects, which are characterized by differences in the spatial distribution of the reflected light.

*As examples, we observe:*

- Effects due to transparency
- Effects due to diffusion (soft focus effects, etc.)
- Effects due to pigments with effects (pearlescent, interferences, etc.)
- Effects due to variations in brilliance, flashes, veiling and glittering.

*The specialist's analysis:*

- Measurement technologies permit access to dimensions that characterize brilliance such as measurement of the DOI, the specular brilliance, and contrast brilliance.
- Verification of these effects can also be performed with digital imaging technologies.
- The multi-angle spectrophotometer will offer the most
- Complete information on variations in spatial distributions.

*Our selected solution:*

- A multi-angle spectrophotometer with 20 different geometries for selecting the relevant variable.

*Special 'Non-contact Multi Angles':*

This makes it possible to measure foundation creams, nail varnishes, powders, lipsticks, monochromes and other pasty or mass care products directly.

The principle is as follows:

1. A spoon is filled with the product concerned and it is leveled with a spatula.
2. The spoon can then be placed in the MA support (at 3 different angles).
3. Once positioned, acquisition can then take place in very good conditions for reproducibility.



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# Color i5

## Benchtop Spectrophotometer



### PERFUMES AND LOTIONS

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Color control allows assurance of color conformity, but also makes it possible to verify other physico-chemical characteristics (concentration, nature, evolution of batches of raw materials, natural or synthetic aromas, etc.).

*Perfumes and lotions can be verified in 2 ways:*

- Verification of the content alone in a specific tub
- Verification of the overall appearance of the content in the container

*The specialist's analysis:*

- The most traditional control is the use of a transmission spectrophotometer where the collected information is the transmittance curve.
- Nonetheless, with the use of a suitable sample carrier, it is also possible to perform reflection measurements, which have the advantage of being less expensive and more versatile.
- Some instruments like the ColorI5 can be linked to a robot with an automatic forwarder for simultaneous measurements of color, the refraction index, etc.





## X-Color QC Software Application

### The One Solution For Color Quality Control

Organize and control color data for all types of surfaces, coatings, and paints in a single, flexible platform with X-Color QC, a new generation of color management technology from X-Rite. X-Color QC gives you the freedom to efficiently control color quality while reducing the margin for error. No need for separate systems. No need to try and patch different programs together. No need to continually reset instruments and product color palettes for each user. X-Color QC lets you take control, including security and data access, all in one, convenient program.

### The Power To Stay Connected

Most current color QC systems need to operate within a network and with information that needs to be shared and distributed among a variety of users, often in discrete formats. The challenge is to consistently meet these requirements while maintaining control over data and user rights. X-Color QC offers solutions that allow any number of locations to easily communicate and share data. Advantages include:

- Supervisory control over user rights and permissions
- Supervisor-directed ability to hide controls and functions for specific users
- Access management over a global database
- Display settings controlled globally or locally
- Display area viewing in a variety of user-directed formats

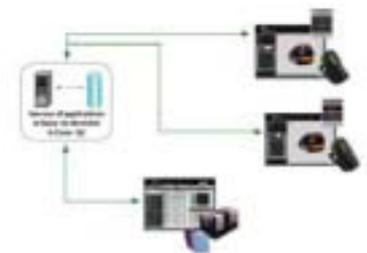
### The Power To Manage Efficiently

Because it is essential to control modern complex colors in the laboratory, in production, and throughout the supply chain, color programs must be as flexible as they are accurate. Without this option, color data management often becomes unwieldy. Processes and programs are held up waiting for data or analysis. Time is lost and customers are placed at risk. X-Color QC supports a variety of database formats and features built-in flexibility to expedite color analysis and streamline reporting and data management:

- Gain full reporting and graphing for thorough analysis
- Enhanced on-screen appearance rendering for clear color footprint
- Create desktops tailored to specific user requirements
- Develop software configurations for specific customer processes
- Produce custom-tailored screen configurations to automate routine functions
- Switch specific display properties for in-depth analysis without affecting overall system settings
- Maintain data from multiple instrument geometries in a single database
- Manage data by user or function

*The principle is as follows:*

1. A spoon is filled with the product concerned and it is leveled with a spatula.
2. The spoon can then be placed in the MA support (at 3 different angles).
3. Once positioned, acquisition can then take place in very good conditions for reproducibility.



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# Macbeth Lighting

## Color Viewing Technology



### Daylight is the sole source of light which does not disturb our color analysis.

Daylight is not constant and varies depending on: weather conditions, the season and the time during the day

Color control should be possible everywhere: in the workshop, in the laboratory and in offices, outdoors as well as indoors and in any location whatsoever.

**A light booth is therefore needed**

### Lighting Systems At A Glance

Lighting Systems	 BOOTH	 LUMINAIRES	 DAYLIGHT	 HORIZON	 FLUORESCENT	 INCANDESCENT	 UV
<i>Filtered Tungsten Halogen</i> <b>SPL III</b>	•	•	Choose One D50/D65/D75	•	Cool White plus TL84 or U30 or U35	•	UV Light Alone/ UV With Daylight
<i>7 Phosphor Fluorescent</i> <b>Judge II</b>	•		D50/D65/D75		Cool White plus TL84, U30 or U35	•	UV Light Alone
<b>Examolite SD840B</b>		•	D50/D65		Cool White	•	
<b>Prooflite PDL440</b>		•	D50/D65				
<b>Prooflite PDL840</b>		•	D50/D65				

#### Chart Key

D50 = D5000K  
D65 = D6500K  
D75 = D7500K

CWF = Cool White Fluorescent (4150K)  
TL84 = TL84 Narrow Band Fluorescent (4100K)  
U30 = Ultralume 30 Broad Band Fluorescent (3000K)  
U35 = Ultralum 35 Broad Band Fluorescent (3500K)

### Quick Guide to Light Sources

#### Daylight

D5000K – Noon sky daylight for graphic arts applications.

D6500K – Average north sky daylight for industrial color management, such as: automotive, consumer electronics, appliances, textile and apparel, home furnishings and others. Specified by industry.

D7500K – North sky daylight for graphic arts pressroom applications, sorting and grading textile white goods, and produce evaluations.

#### Horizon

This source simulates early morning sunrise and late afternoon sunset. Commonly used in textile and automotive applications.

#### Cool White Fluorescent/TL84/U30/U35

Simulates office, in-store, or showroom floor lighting.

#### Incandescent

Simulates home and store accent lighting.

#### UV5X

Higher intensity (five times that of the sun) for detecting optical brighteners and fluorescent whitening agents in paper, textiles, and plastics.

#### UV

The amount of UV found in natural daylight for simulating the effects of optical brighteners and fluorescent whitening agents on color.

*Note: Macbeth system lamps do not contain UV wavelengths.*



## Farnsworth Munsell 100 Hue Test

### Do you know how well color evaluators can see color?

The FM100 Hue Test is an easy-to-administer test and a highly effective method for measuring an individual's color vision. Used by industry for over 40 years, the test is used to evaluate and rank color acuity. This portable, 15-minute test analyzes how accurately you see color. The easy-to-use scoring software indicates where you have a color vision deficiency such as color blindness.

### About the Test

The Farnsworth-Munsell 100 Hue Test itself is used to separate persons with normal color vision into classes of superior, average and low color discrimination and to measure the zones of color confusion of color defective people. Some examples of its use are:

- Examination of inspectors of color goods, color graders and color matchers
- Testing for type and degree of color defectiveness
- Detection of poor color vision in sales people
- Selection of applicants for vocational training
- Design of specialized tests for color vision
- Measurement of effects of medical treatments
- Independent control on validity of other color vision tests.

### Applications

- Examination of inspectors of color goods, color graders and color matchers
- Testing for type and degree of color deficiency
- Analysis of color vision of in-house and field staff
- Selection of applicants for vocational training
- Measurement of effects of medical treatments



### Test Details

- The test consists of four trays containing a total of 85 removable color reference caps (incremental hue variation) spanning the visible spectrum.
- Color vision abnormalities and aptitude are detected by the ability of the test subject to place the color caps in order of hue.
- The four trays are boxed in a handsome carrying case.
- The test must be administered under daylight conditions such as that provided by MacbethLighting SpectralLight® and Judge viewing booths.
- FM 100 Hue Test Scoring Software included with test purchase.
- System requirements: MAC OS X, Windows 98, Windows XP or Windows 2000
- Test complies with ISO and other quality system requirements.

### Farnsworth Munsell Dichotomous D-15 Test

The Farnsworth-Munsell Dichotomous D-15 Test is an abridged version of the 100 Hue Test for screening color vision defects only.

The D-15 Test is intended for the detection of color vision defects such as red-green and blue-yellow deficiencies as opposed to color acuity.

The test consists of a reference cap and 15 removable chips of incremental hue variation.

# NetProfiler 2.0

## Instrument Management Software



Maintain the accuracy and consistency of measuring devices with a system that allows you to automatically test, measure, and profile your instruments over the internet. Using sophisticated software and certified physical standards, the system takes just minutes to produce performance statistics on every instrument within a network.

### NetProfiler Advantages

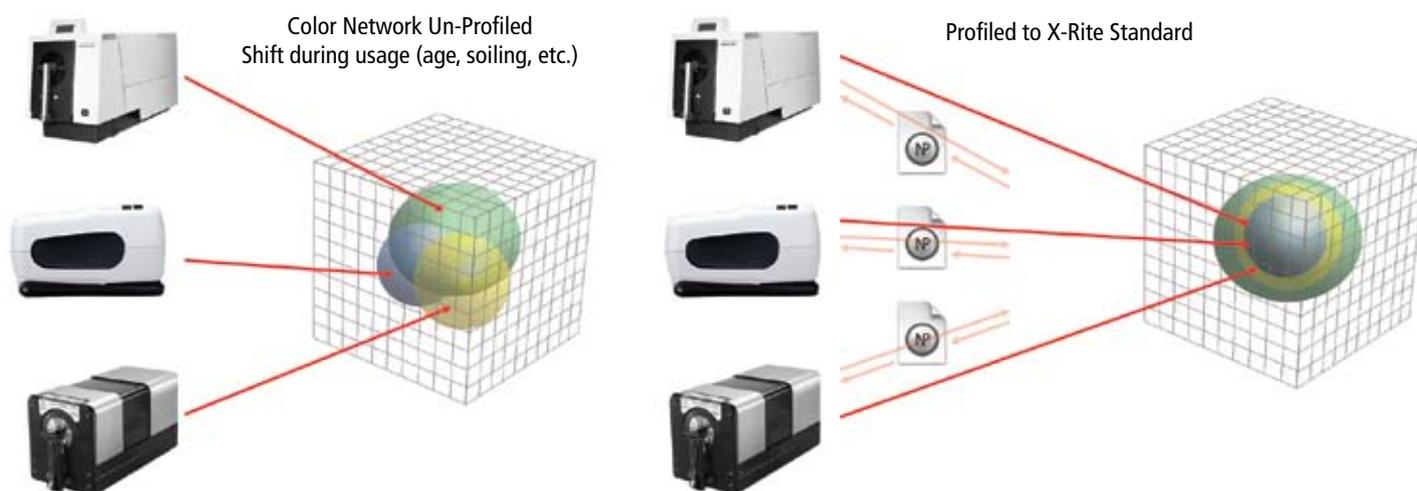
- **Profile Accuracy.** Maintain instrument quality, uptime, and reliability throughout an entire network
- **Diagnostic Reliability.** Sophisticated remote diagnostic tools are available to run on a regular basis for preventive maintenance
- **Communication.** Accurately communicate between instruments
- **Real Time Full-Time Monitoring.** Constant monitoring of all instruments and unlimited report access provides early detection of potential problems
- **Certification Support.** Instruments are certified to meet network performance specifications, including printed certification documents
- **Expandability.** Instruments are easily added to the system
- **Easily Integrated.** Maintain production processes without interruption for service or certification

### NetProfiler System Requirements

Windows 98 SE, Windows ME, Windows 2000 SP4, Windows XP; 450 MHz or higher Pentium III-compatible CPU processor; 64 MB of available RAM; 2 GB hard disk with minimum of 50 MB available hard disk space; Color monitor with minimum resolution of 1024 X 768; Internet connection with minimum 14.4 baud rate; Internet Explorer 5.0 or later

### NetProfiler Licensing

License includes: NetProfiler Client Software; NetProfiler Calibration Card (accommodates 24 profiles); 12 months use of NetProfiler for a single instrument (license must be renewed after 12 months a new Calibration Card will be provided); Access to Telephone Help Desk.



*The NetProfiler system overcomes instrument problems, such as age, soiling, and drift, to create a profiled network that improves accuracy and efficiency.*

## ACCESSORIES

Measurement must be representative of the pursued goal and must also be meaningful. It is therefore necessary to adapt the preparation and presentation of the sample to the measurement. To do this, each cosmetic product in each form must lead to reflection so that the measurement instrument is suited to the sample concerned.

*For mass measurement, standard accessories are found for:*

- Measurement of powders
- Measurement of liquids
- Measurement of non-level items

*It is necessary to select an application mode for measurement after application:*

- Automatic hand-coater
- Pneumatic pistol
- Other applicators for all pasty products

*It is also necessary to select an application support:*

- Contrast card
- Glass plate
- Plastic film (adhesive or otherwise)
- Imitation skin support

A suitable measurement protocol must then be defined.



*How do you choose a measurement instrument?*



## The Color of Success

Numerous challenges and opportunities continue to exist in a global market. Color quality control continues to play an essential role in the development of products and buyers' preferences.

X-Rite offers you the expertise and technologies needed to take full advantage of the opportunities that arise. At the right moment. Every time.

For further information, visit the website [xrite.com](http://xrite.com).

### X-RITE WORLD HEADQUARTERS

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