

Transmission Color Measurement System — TCM

TCM is an innovative measurement system allowing measurement of different types of samples such as liquids, plastics and textiles.

The measurement is carried out by transmission through the surface to be analyzed on the production line. This makes it possible to analyze the evolution of the color throughout the production.

Measurement results can be of 2 different types :

- **Absolute measurement** (thanks to a calibration of the system in spectral sensitivity)
- **Relative measurement** (thanks to a correction compared to a reference measurement carried out on another spectrometer).

The system is composed of 2 sub-assemblies :

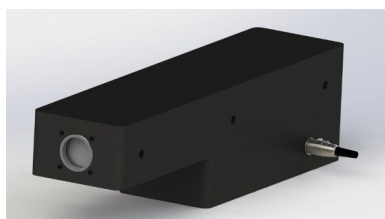
- An emission part allowing the generation of the light beam

Emission part

The emission part consists of a **Xenon lamp** with a power of 15W having a great stability (3%), as well as a long lifetime (5×10^8 hours). This is powered by its own stabilized power supply.

This Xenon lamp is associated with a homogenization bar allowing the obtaining of a homogeneous beam as well as a UV filter blocking the wavelengths located in the UV.

All the elements are positioned in a compact mechanism facilitating its integration within a production line.

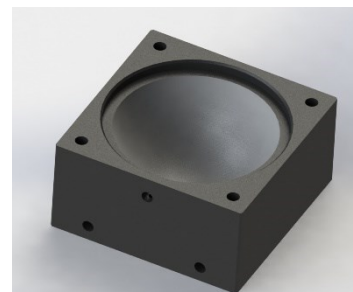
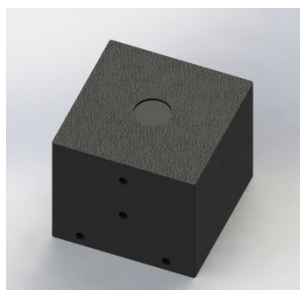


Reception part

The reception part is composed of an integrating sphere 80 mm diameter, treated with Barium Sulphate allowing the homogenization of the measurement beam.

The opening of the sphere is 25 mm diameter protected by a sapphire window.

The reception is located at 90° with respect to the port of entry of the sphere avoiding a direct light on the receiving part.



Electronic part

The electronic part allows the management of the transmission and reception parts by means of a computer.

It's linked to the different elements through:

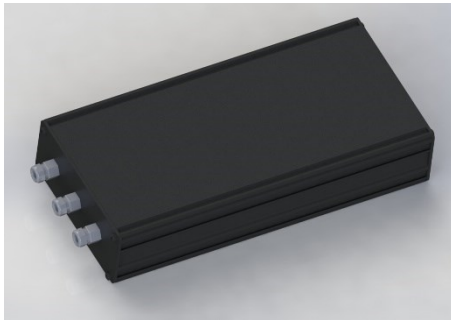
- Electronic cables to manage the switching on and off of the Xenon lamp
- An optical fiber to acquire the measurement of the reception part
- An optical fiber to check the operation of the Xenon source

This set is composed of 2 MSU spectrometers with 10 nm resolution :

- A spectrometer for measuring
- A spectrometer for source monitoring

These 2 spectrometers are connected to the computer via USB cables. They are the ones which manage the switching on and off of the Xenon source..

The electronic part can be located in a climatic chamber in order to regulate the temperature of the 2 spectrometers and to avoid the drifts of measurements relative to the variation of temperature.



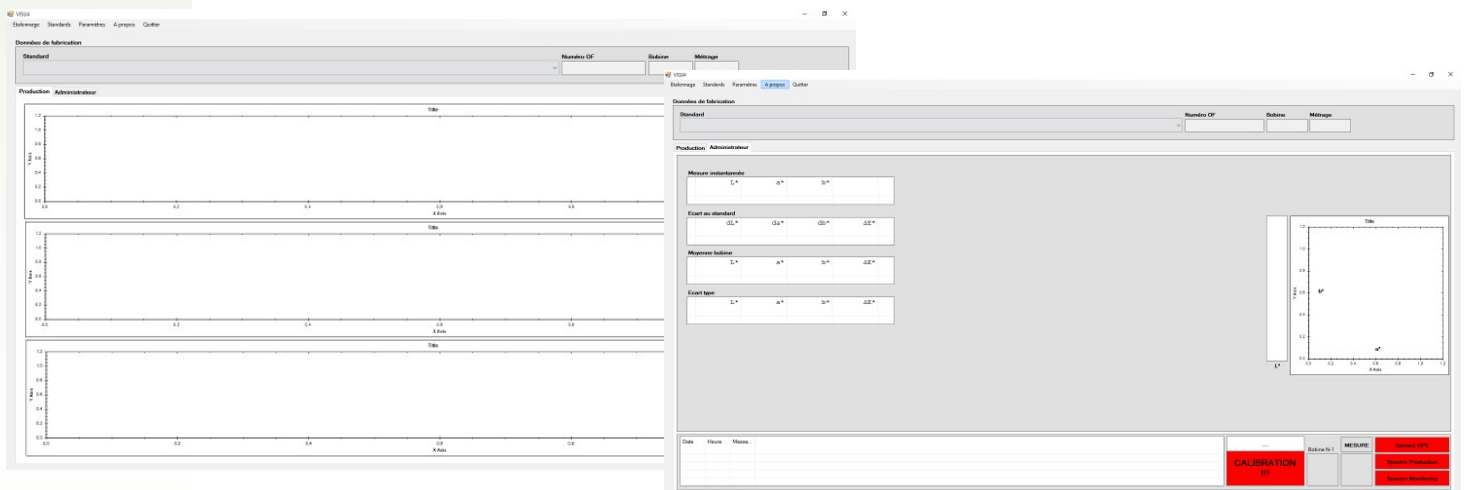
Software

The system is delivered with measurement software allowing the management of the various subsets of the system.

The software displays the evolution of the colorimetric measurements in the Lab coordinates.

Troughout the duration of the measurements, the software saves the measurement results in text files in order to be able to post-process them.

The software can also be configurable according to specific requests related to use (output file, interface, settings).



Caractéristiques du système TCM

<i>Measurement frequency</i>	100 Hz
<i>Optical Resolution</i>	10 nm
<i>Wavelength</i>	From 380 nm to 780 nm
<i>Light source</i>	Xenon lamp
<i>Optical Light power</i>	15 W
<i>Source lifetime</i>	5 x10⁸ h
<i>Transmitting part dimensions</i>	500 mm x 120 mm x 135 mm
<i>Receiving part dimensions</i>	100 mm x 100 mm x 87 mm
<i>Electronic part dimensions</i>	224 mm x 45 mm x 105 mm
<i>Total Weight</i>	2 Kg
<i>Power requirements</i>	230V/50Hz/10A
<i>Computer</i>	Windows 10 ou higher 64 Bits Software : Office

