

# Colour Management for Global Production

**Trend Report.** There is no longer demand for island solutions in colorimetry. Instead, people want global applications in international networks and platforms that work via the internet. Both globally active groups and small-to-medium size subcontracting companies and enterprises can avail of colour-management systems composed of consulting, services, hardware and software that are tailored to nearly all areas of the plastics producing and processing industry.

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Whoever wants to stay in the market nowadays must produce on a global scale. In particular, products that are assembled from many parts need to match in colour. Only those which match in appearance and colour can be sold for the highest possible agreed price. International producers or those who arrange for such production deploy colorimetric instruments for the purposes of quality control – and these instruments need to match in all plants of all the participants in a production or supplier network. The reality is, though, that all kinds and makes of instruments are used in practice. It is time-consuming and expensive in the fast-paced world of today to practice and retain the conventional and very laborious methods of instrument management. One remedy here is to use rapid internet solutions, such as the

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Enterprise Color Management (ECM) from GretagMacbeth (Fig. 1).

ECM increases the efficiency of colour development, from the draft stages of new plastics products and their specifications right through to global procurement of the materials. This approach leads to rapid product launches onto the market and conduces to lower costs and greater profitability while yielding constant, reproducible colours across the entire supplier chain – at other production facilities, at subsidiaries, suppliers and business partners. ECM promotes greater efficiency of user-related workflows and all the available instruments, irrespective of manufacturer. It is aided in this by a software package for managing colorimeters that goes by the name of NetProfiler. This ensures that all colorimetric instruments which originate from all kinds of manufacturers and are involved in the global production process are measuring correctly, with the result that all users in the network can produce compatible parts.



**Fig. 2. Colorimeter with 45°/0° measuring geometry** (photo: Minolta)

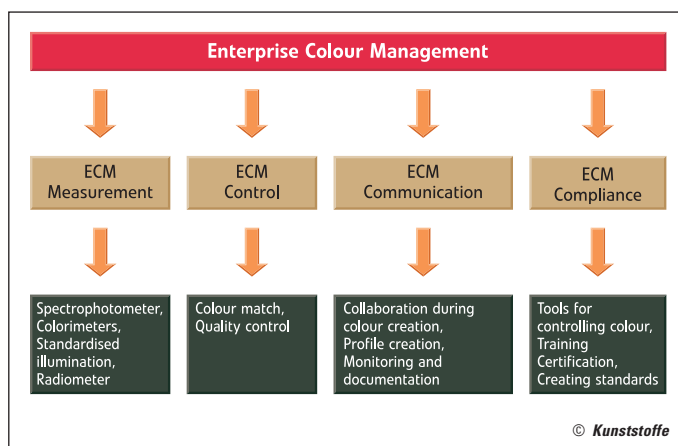
## Faster Market Launch through Matched Colour-management Software

Datacolor, too, offers international users a fully integrated solution, comprising software, instruments and service that is designed for effective, automated colour management along the full supply chain. Datacolor Spectrum provides all companies involved in the workflow with access to a central platform for mutually accelerating all colour developments and matches. The resultant optimised communication facilitates faster market launching of products and cost savings, e.g. in creating samples – an aspect that is becoming increasingly important in the plastics industry as margins fall and raw materials prices rise. The modular software components may also be used individually. Thus, existing colour-management systems can be augmented as required with modular solutions for colour correction, quality control, visualisation, communications and production optimisation. Datacolor Maestro, a diagnostic software program, harmonises all Da-

**Fig. 1. A global colour-management concept**

(source:

GretagMacbeth)





**Fig. 3. The Spectro-guide combines colour and gloss measurement in one** (photo: Byk-Gardner)



**Fig. 4. New measuring principle rules out any influence exerted by the direction of measurement** (photo: Byk-Gardner)

tacolor spectrophotometers employed to a reference device.

### Colour Matching Service through Internet Platforms

A consortium of reputable companies, such as X-Rite, SpecialChem, Ciba Spezialitätenchemie, DuPont Titanium Technologies and Nelly Rodi, offers a comprehensive service for facilitating and accelerating the colour-development process. In matchmycolor.com, they have an innovative online service platform for rapid, easy formulation of individual colour hues.

This internet platform offers formulators, engineers and designers an online colour-formulation service as well as technical support for the colouring process. The system comprises a colour-formulation software program that contains extremely comprehensive and homogeneous colour databases from different pigment manufacturers that cover the full colour spectrum. Further advantages are a program for costing recipes, an ap-

plication-specific expert system, technical online support from independent colour experts and rapid provision of samples in the form of colour sample chips.

Ciba Spezialitätenchemie and Konica Minolta, also in collaboration with Colibri, run an interesting platform featuring colour-recipe service and colour-hue management. Apart from marketing the software, Konica Minolta can exploit the powerful organization of the Ciba Color Services business unit to additionally offer a database service, technical support and training in the areas of colour formulation and quality control.

### New Colorimetric Instruments of Maximum Precision and Dependability

In the automotive sector, a fast-growing plastics-consumer market, a large proportion of applications of colorimeters are to be found in interiors, where value and colour harmony have now evolved into a major sales pitch. The materials employed have many different surface structures, each of which necessitates colour matching and adjustment. Given the large number of suppliers involved in the processes, this is a huge challenge. Plant standards issued by the auto makers and international standards, such as VDA 280, prescribe the use of colorimeters with a 45°/0° measuring geometry for the measurement of plastics applications in the vehicle cabin. Three suppliers have now come onto the market at the same time with new, high-precision, spectrophotometers aimed at meeting these needs (Fig. 2).

The new portable Konica Minolta CM-2500c has a 45°/0° measuring geometry that complements the existing product line of the portable spectrophotometers CM-2600d/2500d with ball geometry. These instruments are renowned for their simple ergonomic operation and high measuring accuracy. These advantages also reside in the CM-2500c, which is therefore just as easy to use as the other models in the series.

### Combined Colour and Gloss Measurement in One Instrument

The Spectro-guide from Byk-Gardner is the only 45°/0° colorimeter that simultaneously measures colour and 60° gloss as per ISO, ASTM and DIN. The screen simultaneously displays the colour and

gloss values and this allows the reason for a deviation to be clearly identified at once (Fig. 3). The Spectro-guide even performs highly reliably on grained and structured surfaces. A new, patented measuring principle guarantees for the first time 100 % all-round illumination that eliminates any influence of the direction of measurement and so ensures high repeat accuracy (Fig. 4).

### Orange Peel and DOI also Measurable on Small and Curved Parts

Whereas it had been difficult, if not impossible, up to now, to objectively assess orange peel, long wavelength and short wavelength characteristics and distinctness of image (DOI) on vehicle modules, such as dampers, tank flaps, mirror housings or motorcycle parts, they can all be measured now on one hand with the new Micro-wave-scan. Additional information is provided by the structural spectrum, which aids optimisation and troubleshooting. DOI is an objective measure of brilliance and gloss, irrespective of coating system and curvature of the surface. Also available are customer-specific scales, which make routine quality control checks much easier. Apart from the



**Fig. 5. Equipment for measuring plastics granules** (photo: Byk-Gardner)



**Fig. 6. Spectrophotometer for automotive interiors** (photo: Datacolor)

innovative products, practical application tools, such as the measurement of plastics granules by means of a large, rotatable and coverable cuvette, were on show (Fig. 5).

The full range offered by Byk-Gardner was rounded out by the new micro-TRI-gloss meter. Documentation for all the surface-measurement systems shown has been kept simple. The bundled software enables the readings to be transferred direct to Microsoft Excel and to be presented immediately as a chart in a professional QC report.

### Laboratory Applications and Online Colorimetric Systems for Precision Colorimetry

Datacolor's response to the requirements of the automotive industry and its guidelines for vehicle interiors is a new 45°/0° dual-beam spectrophotometer (Fig. 6).

The new X-Rite Premier 8400 laboratory spectrophotometer now makes it possible to also measure the colour of plastic preforms in reflected and transmitted light (Fig. 7). Hunterlab offers a reference-grade spectrophotometer called UltraScan PRO (Fig. 8). It measures in both reflection and transmission mode, and complies with CIE, ASTM and



Fig. 8. Colour measurement under standardised UV light (photo: HunterLab)



Fig. 9. Colour checking and classification of compounded plastics (photo: X-Rite)



Fig. 7. Detail of colour measurement of a plastic preform (photo: X-Rite)

USP guidelines. With a resolution of 5 nm, it achieves maximum measurement accuracy. For the first time, the light source has been standardised in both the UV and the visible range. This has substantially extended the measuring range to allow accurate measurements of fluorescent samples and in the near-infrared range.

### Online Colorimetry

HunterLab has developed an online system for measuring transparent samples. The instrument has two heads (transmitter and receiver), between which continuously passes the material under examination, such as transparent plastic film.

For online monitoring of bulk goods, such as plastics granules, X-Rite offers the Teleflash colorimeter. The special design of the spectrophotometer permits reproducible measurements under even the most adverse ambient conditions, such as vibration, dust, damp and aerols. Since the colour is checked continuously, rapid intervention to correct pigmentation is possible to prevent the production of scrap, which is often noticed too late. The system is already being used successfully in several production shops for the purposes of colour checking and classification of compounded plastics and other bulk goods (Fig. 9).

### Verification of Colours in Assembly and Segregation

X-Rite is tapping completely new ways and markets with its VeriColor. The key target market for the new system is tier 1 auto subcontractors because of the strict colour-checking requirements that those

OEM customers in the automotive sector who use ILVS (in-line vehicle sequencing) impose. VeriColor is a new system for high-resolution colour checking and identification that is designed to reduce colour error in assembly and segregation processes. It combines the advantages of a non-contact instrument and the ruggedness of industrial colour sensors with the accuracy of a spectrophotometer of laboratory standard for accurate, reproducible pass/fail colour measurement. ■

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