

Brillux Scala - Development of an Application-Orientated Colour System

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The contribution presents the designing process of Brillux Scala and the outcome itself, an application-related coding system for the methodical acquisition and designation of body colours. The authoress has directed the project, been responsible for its concept as well as its results and has also created both the product and the graphic design.. Several national and international design awards have been conferred to the project, among them the iF Communication Award and The Design Award of the Federal Republic of Germany. The combination of methods related to perception with those of metric valences has led to an entirely new colour system as orientated towards application.

Colour system, Colour design tool, Colour visualisation, Colour application

1 Introduction

The richness of colours in nature is infinite. Colours are difficult to handle and even harder to describe. Perceiving colour is a subjective experience. We are able to distinguish between one and ten million different shades, depending on the configuration and capacity of our individual apparatus of visual perception - in any case, only a fraction of all the existing colours. In order to get an idea of the endless variegation and to be capable of communicating about colours when wanting to work with them, colour systems are needed. Since ancient times, scholars, scientists, and artists have been trying to organise colours in order to understand them. The most well-known colour systems at present are the Munsell System, the CIElab System, The Natural Colour System (NCS) and the Ral Design System (RDS), which can be regarded as meta-systems since they have been developed independently without relation to any specific needs of a given company. Contrary to them, the colour system presented here is the result of a three year intensive research, development and design process, conducted by a company that produces body colours for coated surfaces, mainly in architecture but also for industry and craftspeople.

2 Objectives

The idea of the project has been to create an individual coding system applicable to the methodical acquisition and designation of colour pigments for the purpose of communicating on colours and working with them. The aim has been to codify all the company's coating materials according to the new Scala system. After all, within its branch the company offers 12,000 different products, including a wide range of interior and exterior paints, varnishes, woodstains and

dispersion coatings. Additionally there are amounts of coating products for non-architectural use, specially adapted to any form of industrial application, material and stress condition. The completed Scala colour codes were to be incorporated in modern mixing systems to enable painters, architects and builders freely to purchase their individual coating material at any place on the global market.

The company's goal has been to provide each exact colour that any client might need in a given product and not only to guarantee the punctual deliverance in a constantly high quality but also to ensure the availability of working means concerning planning, designing and creating. In any project, colour design must be customized to satisfy such factors as the building style, current colour trends and the design image a customer wants to create.



3 Methods

3.1 *Scientific versus Visual Approach*

As a matter of principle we differentiate between colour systems, which are based exclusively on the visually perceived colour impression (like NCS) and those based on strictly scientific and international standards of chromatometry (like RDS and CIElab). The Scala system unites the positive characteristics of both concepts. The combination of methods that are purely related to perception with those based on metric valences has resulted in an application-oriented system that is entirely new.

3.1.1 *The Valence-Metric Method*

The valence-metric method is based on international standards of chromatometry. Every colour can be scientifically defined by the interrelation between its three basic parameters, hue, saturation and lightness. Thus, a representative colour system has to coordinate these three parameters in a necessarily three-dimensional layout.

Hue is the most important parameter, because it is decisive for the colour expression itself describing the chromatic value, that is whether a colour is yellow, orange, red, violet, blue, green or in any other shade of the visual spectrum of the pure colours. Achromatic colours on the other hand are all intermediate shades (greys) in between white and black including the poles white and black themselves.

Saturation is the second parameter, greatly influencing the quality of a colour. The saturation describes the degree of achromatic components within a shade; the more

saturation a certain colour has, the closer it gets to the pure colour of the spectrum, the less saturation, the nearer this colour is to an achromatic shade.

Lightness is the third parameter, describing the degree of light-reflection from the colour surface, the light reflectance factor. The specific lightness or darkness of any colour is quantifiable in relation to a neutral scale of greys from the absolute white to the absolute dark.

3.1.2 *The Perception-Based Method*

To characterize a colour you can also describe what you see. It is not enough to identify a colour with pigments and their mixtures or with wavelengths and physical stimuli. How the colour is mixed and the measurement data are necessary for production, but we need a colour system respecting the way people see and sample colours. By help of perceptive notations it is possible to describe the purely visual properties of the colour experience in terms of their degree of visual resemblance to related colours. These resemblances can be regarded as elementary attributes, helping to control, correct, add to and adjust the result of the valence-metric method as described above.

3.2 *Context-Related Approach*

As already mentioned, the Scala system is oriented towards application. Creating a meta system of proper scientific criteria has never been intended. What exactly does "application-oriented" mean then? How is it possible to choose a logistically easy-to-handle amount of different shades from the millions of colours existing? What volume is needed? To answer these questions as well as numerous other context-related ones, a group of experts in different fields have been assembled to contribute their specific knowledge to the various demands of design, current colour trends, colour psychology, building styles and other architectural details, historical aspects, city-building codes and possibilities of production. This approach has finally led to the presented results.

4 **Results**

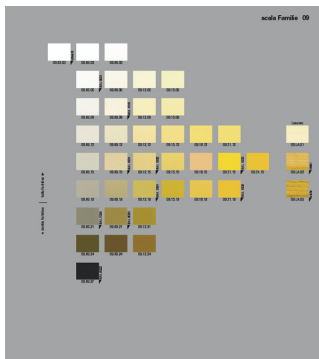
The Brillux Scala system was introduced to the market in 2001. Since then, all companies' surface coating formulations are designated in their entirety according to the Scala system that enables all the design work to be closely co-ordinated and concisely defined. Today, the entire system consists of 1,364 different body colours that are visually perceptive and clearly arranged within 32 colour "families", plus a separate group with a series of the neutral greys. Each position is defined by a Brillux Scala Code specifically developed for the particular name of each shade.

4.1 *The Working Means*

4.1.1 *The Scala system is a comprehensive, application-oriented colour system for experts of colour - architects, interior designers and processors - that provides them with an extensive tool that covers the entire colour spectrum with the greatest possible uniformity. Suitable working means and a broad service system have been developed to enable and simplify the designing and planning process. The Colour Atlas*

The heart of the system is the Colour Atlas that presents the whole range of colours and shades. The starting point for the colour spectrum is a 32-part colour circle of pure

colours. Each of these individual shades of the colour circle is associated with a specific page of the same hue in the Colour Atlas. Each page of the Colour Atlas is assigned to one shade of one particular colour family. Together with the page for the series of the neutral greys, these 32 families form the entire system with its volume of 1,364 different shades. It incorporates even a total of 68 woodstains and 14 metallic colours, which are assigned to the family pages according to their colour. On each page of the Atlas, the hue is graded horizontally by saturation and vertically by lightness into visually uniform increments. The 32 Scala colour shade families progress from pure yellow through orange, red, violet, blue and turquoise to green and back to yellow to encompass the entire colour spectrum.



The pure tone is shown on the outside of each page corresponding with one colour shade. This position within the horizontal plane results from the level of its maximum saturation, whereas the vertical grades indicate the levels of the intrinsic lightness.

The saturation increases uniformly over the entire page from a very low level of saturation on the left of the Atlas page to the maximum saturation on its right

The lightness of all the levels of saturation increases with uniform increments from the complete light at the top of the page to the complete dark at its bottom. Consequently the light shades are arranged within the top half and the dark shades within the bottom one of each page of the Atlas.

4.1.2 The Colour Box

The tool most often used is the Colour Box containing all 1,364 colours of the system. They are assigned to three different colour sections: "Light Shades", "Dark Shades" and "Woodstains". The subdivision of the sections into light and dark is due to the specific demands of simplifying the application of Scala in architecture and interior design. The "*Light Shades*" and "*Dark Shades*" section volumes are handy and easy to use. For instance, when colours for facades are required, you should normally refer to the section of "Light Shades", whereas "Dark Shades" should be consulted for colours of plinths. Like this, the Scala spectra of light and dark can entirely be covered as well as clearly and conveniently be summarized. Moreover, the two sections can be used simultaneously as becomes apparent when you consider their mirror-symmetrical arrangement. If the colour sections are placed next to each other in such a manner that the two cover pages can be read, then the joints are on the outside. If the section page of a specific colour family and saturation level is opened in the "Light Shades" then the

continuation corresponding to the page of this section can also be opened in the section of "Dark Shades", thus joining the pages of both sections in order to obtain a complete progression from light to dark. If certain lightness or saturation levels of a colour family have not been assigned in the "Light Shades" or "Dark Shades", or if these section pages are missing entirely, then neighbouring section pages can be consulted to supplement and complete the progression.



As a special feature of the Scala System, a separate section of "*Woodstains*" has been integrated into the Colour Box. According to their shade, they are assigned to each individual family of colours. With their equivalents in the Colour Box, the stain colours form a separate section that supplements the light and dark shades and thus help producing the complete range of Scala.

4.2 *The Advantages of the Scala System*

4.2.1 *Convertibility*

The Scala System has been converted into the two most important meta systems of the European continent, namely the Natural Colour System NCS and the RAL Design System. Consequently, the equivalent of all NCS and RAL design data can instantly be found in the Scala system, thus simplifying the implementation and application of colour schemes. The NCS and RAL design codes have been applied on perforated masks inserted in front of each Atlas page so that the converted code can directly be assigned to the corresponding colour shade of Brillux Scala. Furthermore, to simplify orientation a black mask has been adopted for the NCS Code and a white mask for the RAL design code.

4.2.2 *Form of Presentation*

Since the perception of colours is significantly influenced by the colours of the ambience in which they are seen, in Scala all the colour shades are generally presented on a neutral, grey base in order to isolate and accentuate the colour type of the given shade as well as their saturation and lightness in the best possible way. Moreover, for better assessment and in order to show the Scala colour shades in relation to white as the lightest neutral colour and to black as the darkest, each colour page of the Atlas includes a white and black perforated mask.

4.2.3 *Special Selectors*

Additionally, Scala has a number of special selectors. Individual colours or colour series are presented on a corresponding special selector page in the Colour Atlas, specifying a

more detailed comparability with the help of specific properties (colour circle,, grey, white, pastel, metallic, wood stains).

The Scala system incorporates a total of 68 woodstain colours, which are assigned to the family pages according to their colour. They are located on the outside right-hand edge of each Atlas page. This shows the colour relation of the woodstains with the other colours as a stimulation for design work. Scala also includes metallic shades. There are a total of 14 metallics which simulate the colours of different metals and alloys so that in the event of damages through corrosion and the like surface coats can be matched accurately. As with the woodstains, the 14 metallics are assigned to the individual family of colours in keeping with their colour character, and they are presented at the bottom edge of the corresponding Atlas pages. Here, too, references to allied shades of the same type of colour indicate the affiliation of the given metallic to the corresponding family of colour shades.

4.2.4 Integration of RAL classic

The Scala system includes all the 198 RAL classic shades of the RAL K-7 colour sample range which have been assigned to the 32 families of colour shades and the page of neutral greys. This integration presents the individual RAL shades in their colour context for the very first time so that design solutions and applications involving specific RAL colours can now be completed in a very simple manner with the range of Scala colour shades. Although the RAL colours are coded according to Brillux Scala, they still retain their original RAL designation. As a result of this double designation they can easily be identified on the Atlas pages. Moreover, locating a specific RAL colour is made exceptionally easy by consulting the Scala Coding Brochure or the Scala Coding CD.

4.2.5 Pablo – a Colour Shade Matching Instrument

Pablo is a n instrument of matching colour shades for professional use and as such, a good complement to the Brillux working tools. It measures existing surface colours and gives choices from Scala, RAL classic, RDS and NCS product ranges a few seconds after applying the LED-sensor to a sample surface. The instrument is as portable, light and handy as a mobile phone and has a stored memory of up to 20 color shades. It works on smooth flat surfaces e.g. walls, doors, furniture, and can simply be operated.

5 Discussion

A well-elaborated colour-system is no indication of good colour design. This is still dependant on the user we have been working for with all our enthusiasm and joy - the creator as well as the expert of colour for whom the Scala Colour System has been developed. Since Scala has never been meant to be a closed system, a second phase of development has recently been started with the objectives of adjusting the volume, respecting the feedback of the market and the updating trends. As it now seems, approximately 200 new shades will have to be added..