XL BLOOM SERIES

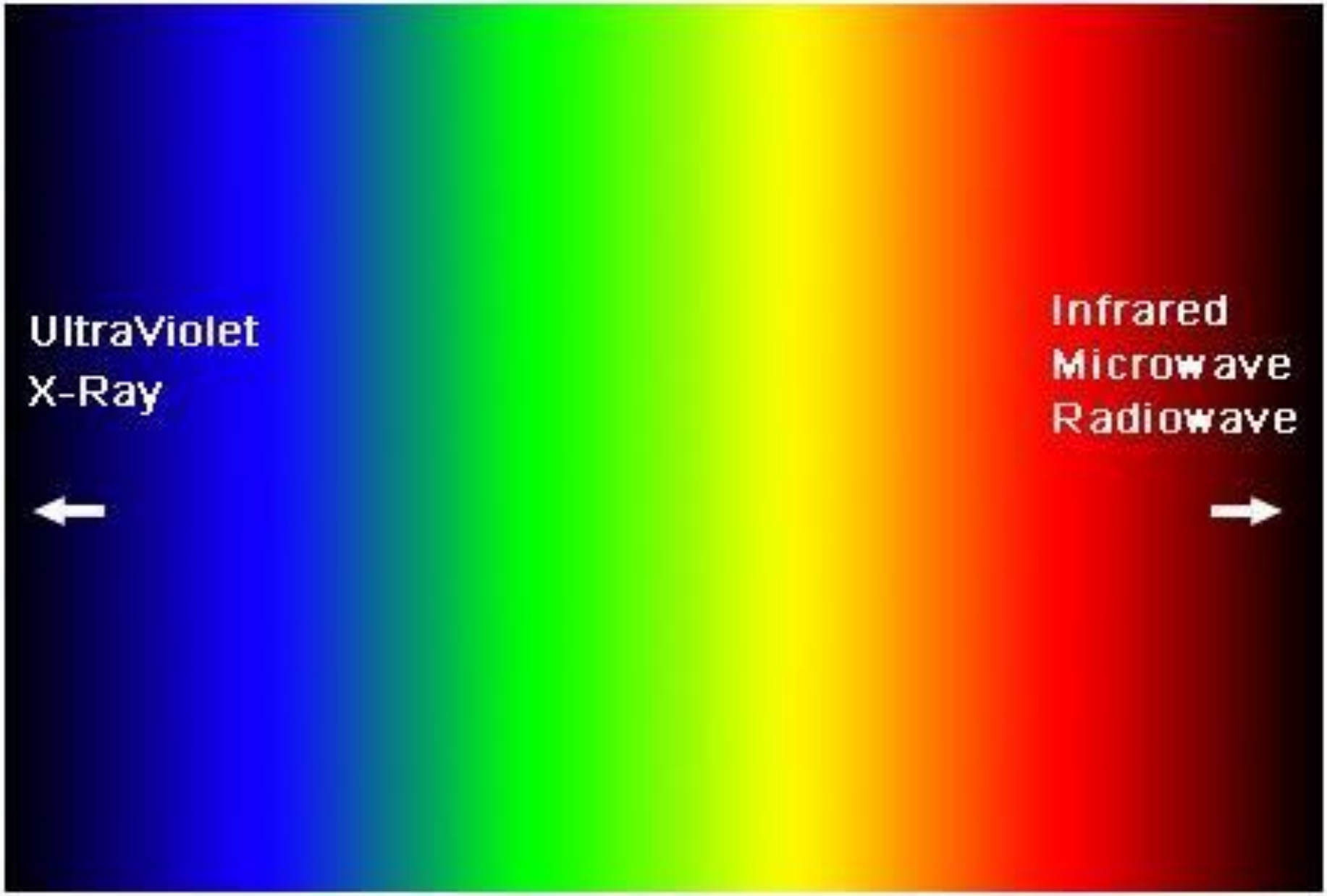
JET BLACK FINISH

What Is XL Bloom?

Colour depth improver of various textile goods especially dyed with black & dark dyed colours. Produces jet black effect on textile goods.

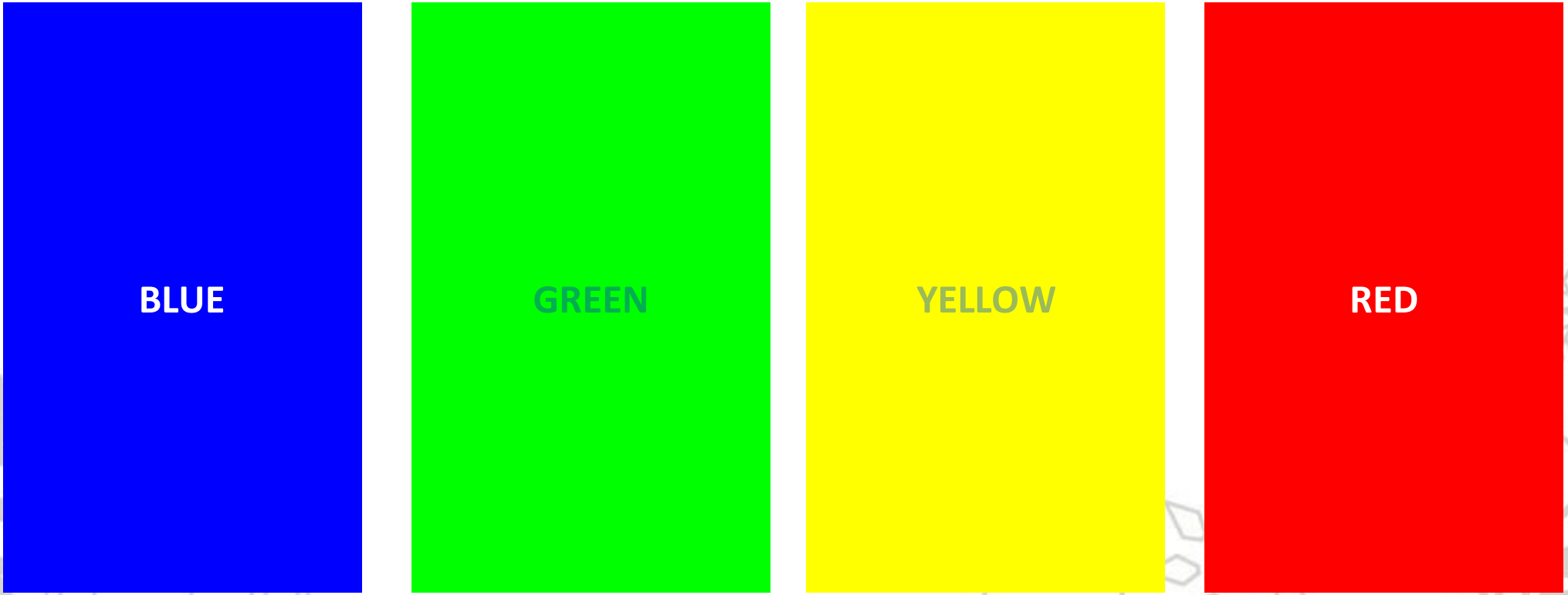
Colour can be broadly defined as the effect on the brain of an observer when an object is viewed in presence of a light source.

How Is Colour Perceived ?
A Light Source

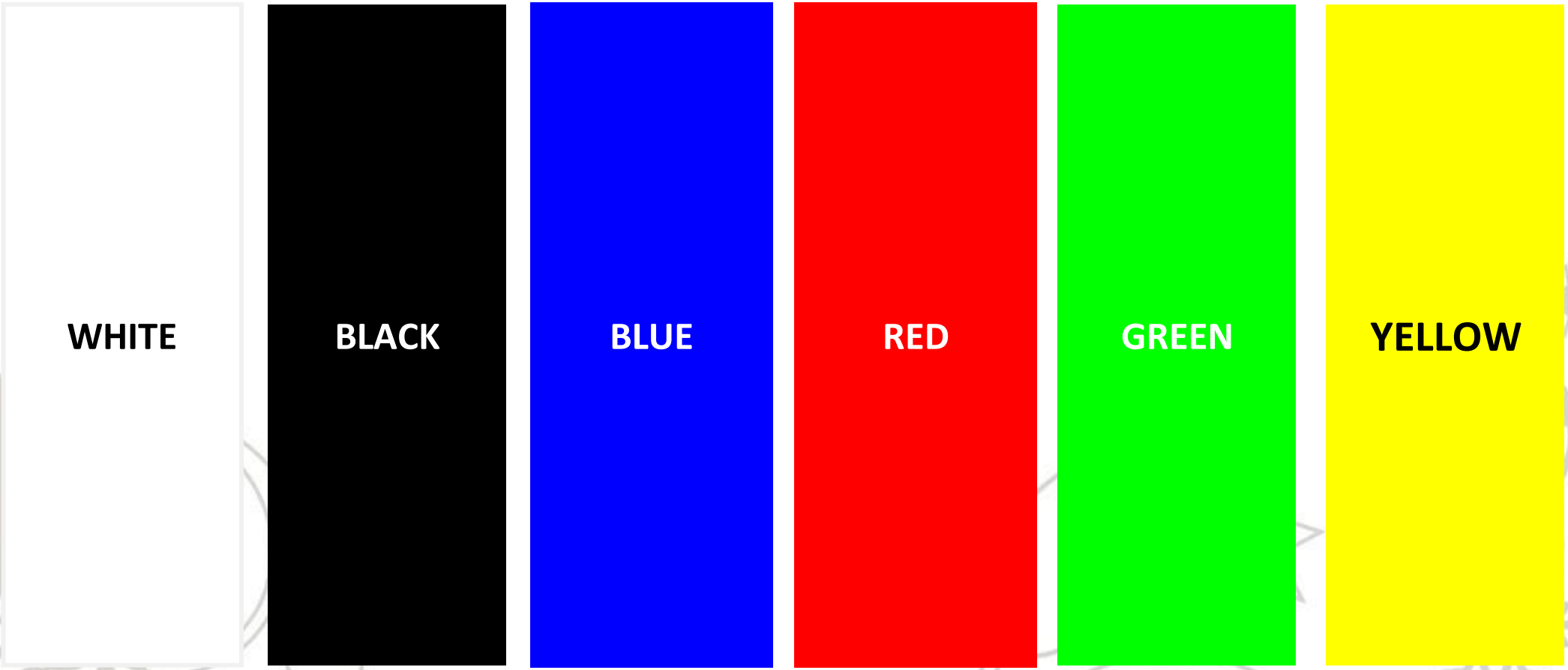


Human Perceive 6 Basic Colours
2 Achromatic Colours

Human Perceive 6 Basic Colours
4 Chromatic Colours



Colours Were Described By Their Basic Colour Terms Such As



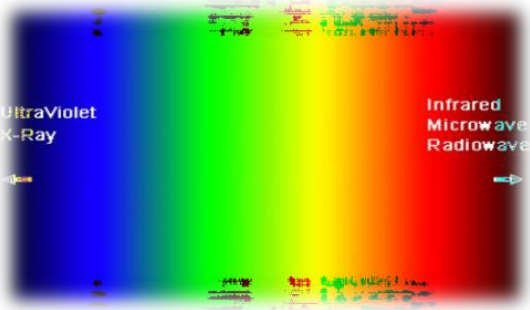
How we select colour deepening auxiliaries

What is L*Value?

Deep-dyeing auxiliaries should be selected for their L*-value

In deep black dyeing of polyester, the use of a deep-dyeing agent that improves the L*-value does yield a deeper black, however, according to visual perception assessments from apparel firms and consumers, the difference is unrecognizable to be casual observer. L*-values easily perceived as jet-black by the human eye are in the 9.0's. XL Bloom Series maintains L*-values within that range, producing bluish black shades on polyester.

Scientific approach towards Quantification of Colours



Simple colours are the proper colours of the elements i.e. Fire, Air, Water and Earth

Black mixed with sunlight and fire turns crimson

Aristotle believed Yellow came out of lightness and Blue out of darkness

Colour Scale

75% Light 25% Darkness = **Yellow**

50% Light 50% Darkness = **Red**

25% Light 75% Darkness = **Blue**

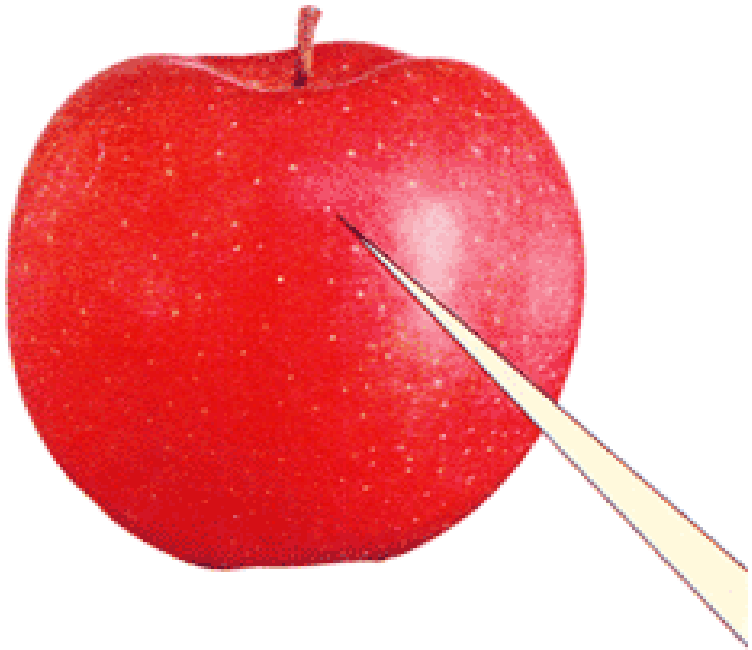
$$\Delta L^* = L^*_{sample} - L^*_{standard}$$

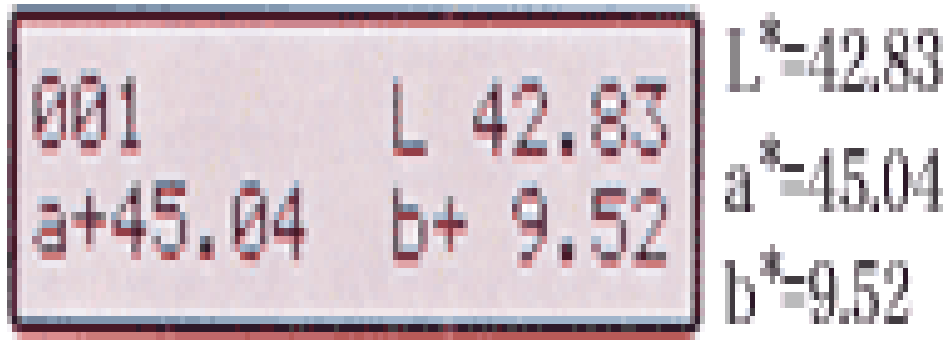
$$\Delta a^* = a^*_{sample} - a^*_{standard}$$

$$\Delta b^* = b^*_{sample} - b^*_{standard}$$

$$\Delta C^* = C^*_{sample} - C^*_{standard}$$

$$\Delta H^* = H^*_{sample} - H^*_{standard}$$





•Fig. 1 L*a* b* color space

•Numbers are more accurate than words at color communication

•Example) Indication of the color of an apple in numerical figures: L*=42.83, a*=45.04, b*=9.52, Once you learn about hue, lightness and saturation in color, you might wonder if there are more accurate ways of describing colors other than using words. Quite so. These three attributes of color can be transposed into figures that indicate human perception. In this way, anyone can communicate colors through expressions common to all. First, let's look at Fig. 1 in which L*, a* and b* coordinates are shown. When indicating a color by figures, lightness is represented by L*, and chromaticity (hue and saturation) by a* and b*. a* and b* each specifies the orientation of color, in terms of Red/Green and Yellow/Blue balances respectively. The following coordinates indicate the color of an apple.

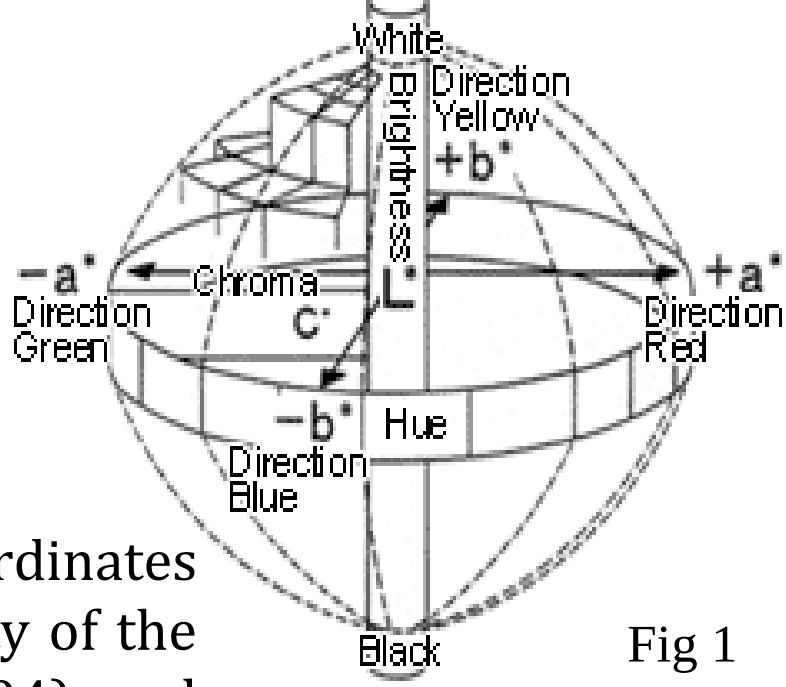


Fig 1

Now, let us find out what color these coordinates represent. Look at Fig. 2, where the chromaticity of the apple is indicated by point X, where a*(=45.04) and b*(=9.52) cross over. Equally, the tone of color can be found by assigning numerical values along the axes of lightness and saturation in Fig. 3. All of this can be summarized in words as 'a bright reddish shade'.

Accurate figures for Saturation C can be worked out using the following formula.

$$(c^*) = \sqrt{(a^*)^2 + (b^*)^2}$$

Colour deepening auxiliaries should be selected for their L*-value. L* value represents brightness, and a* and b* value does chromaticity – the orientation of colour, in terms of Red/Green and Yellow/Blue balances respectively

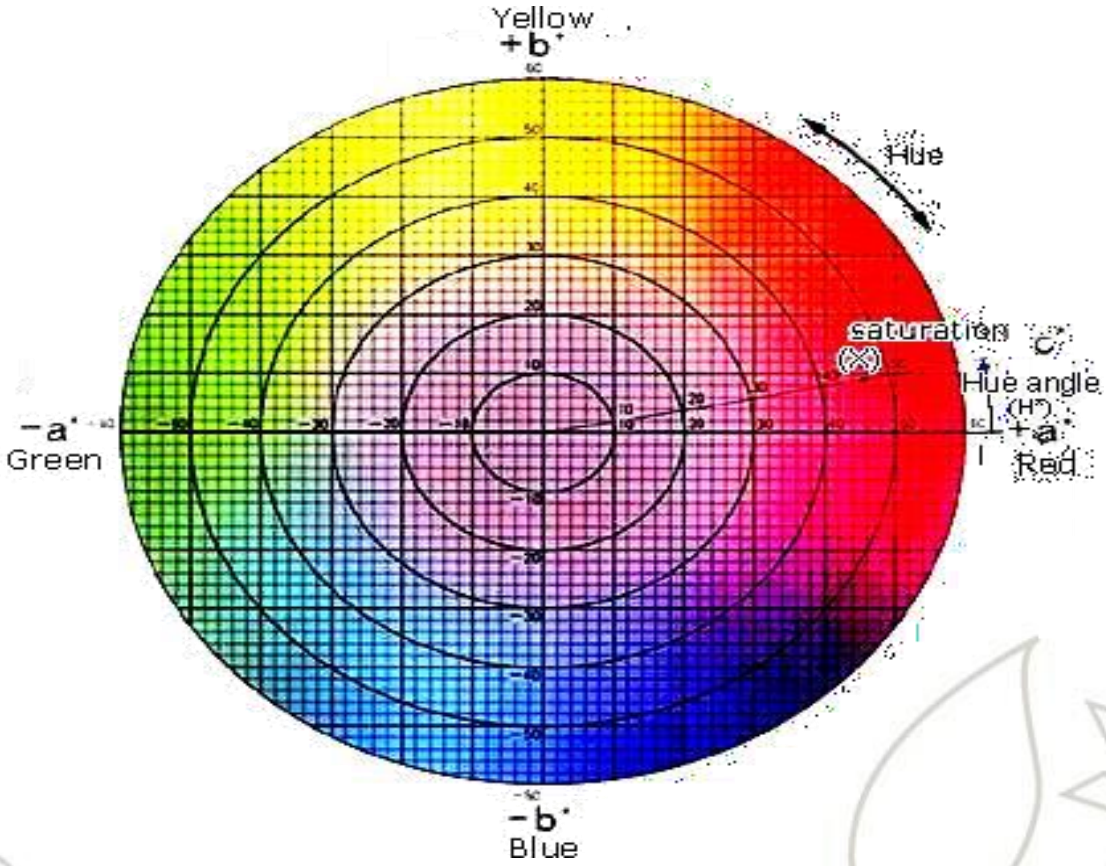
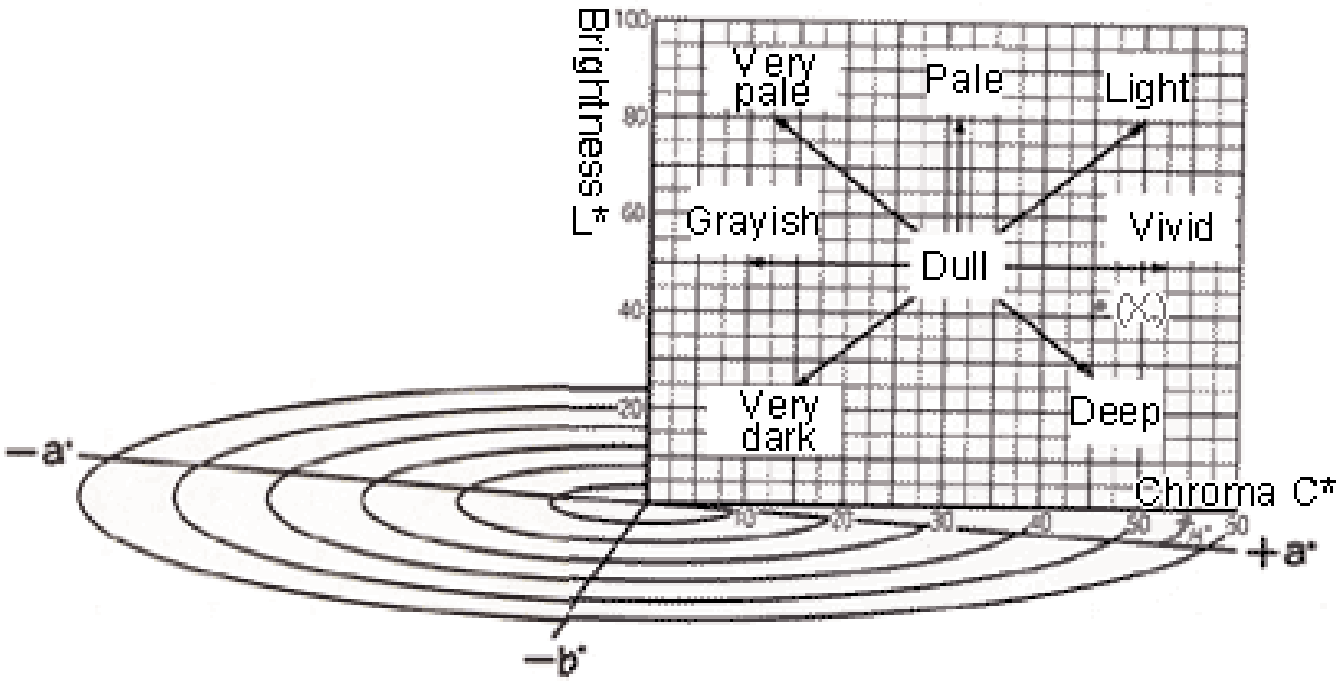


Fig 2:L*a*b* color space Chromaticity [hue & saturation]
The warp axis represents lightness

•**Fig. 3 Tone (lightness and saturation)**



Above Fig shows a cross section (from X) of the diagram in Fig. 2.

The warp axis represents lightness.

You may also refer to Fig. 1 for a better understanding.

*Hue angle H° can be worked out using the following formula.

H° =tan-1(b*/a*)

Jet black finish on polyester

L—value above 11 is not perceived as jet-black by the human eye. Good jet black agent should produce L*-value in 9 ~ 10

XL Bloom-series produces an astounding Jet black on polyester, L*-value inthe 9.0's

Without Xl Bloom

With XL Bloom

Jet black finish on polyester

XL Bloom- series are suitable for all polyester goods which need full black

Chador, hijab and other black wear

- For polyester, black color goods
- Produces jet-black, elegant shade
- Also for deep colors [e.g. deep green, deep navy]

Precaution Manual for XL Bloom Series

Precautions to be taken while applying XL Bloom Series:

Application of Xl Bloom Series on fabrics is very tricky finishing technology & requires much knowledge and skill in quality control. Care in all processing steps right from fabric suitability, fabric selection, fabric dyeing & after dyeing treatment, padding of **XL Bloom Series** on fabrics, drying and curing etc. Because,

The treatment of color deepening agent on fabrics already dyed in black involves the **RISK,** that it is not possible anymore to repair it, once treated fabrics get finished with **PROBLEMS.**

To avoid such **RISKS** in advance, **THE PRECAUTION MANUAL** is made to clarify causes of problems

Precaution Manual for XL Bloom Series

Clarification of causes of problems as risk factors

1. **<u>Properties and mechanism of XL Bloom Series</u>**

- Product is made of polyurethane polymers and inorganic sub-micron powder emulsified and dispersed in water with the help of cationic surfactants to form **stable emulsion**

- Product emulsion is **stable in neutral to mild acidic pH**

- Fabrics once treated with **XL Bloom series is difficult to rectify** after drying and curing at high temperatures, as there is no way to remove from the fabrics

- **Color deepening strength rate** is physically dependant on **surface flatness & smoothness** of treated fabric . Higher color deepening effect on surface flat fabrics and weaker or no color deepening effect on surface roughened fabric by the color deepening mechanism = physical/optical law that the color deepener on the fabrics makes black color diffused and reflected for more color intensity in L value

Precaution Manual for XL Bloom Series

2. **Factors responsible:**

As stated above, Product emulsion is **stable in neutral to mildly acidic pH. Any Residual** alkaline chemicals and anionic chemicals in fabrics after dyeing will destabilize the emulsion:

- Emulsion break causes gradual deterioration of color deepening effects leading to color tailing problem

- Emulsion break makes white spots, chalk marks and color fastness deterioration to washing/rubbing

- Emulsion break produces defects after several months of storage in the warehouse and transportation

- Use of dyed fabrics which is not suitable for **Colour deepening treatment** causes **no color** or **weaker** color deepening effects.

- To test **CDA,** use always the same fabrics, flattened for crease free surface by hot press ironing, as **color deepening effect/quality** are dependant on yarn & weaving styles

Precaution Manual for XL Bloom Series

3. Individual process control & care taken in advance to remove/reduce such problems and risks

A. <u>Care for fabric selection by testing color deepening effects</u>

- Dyed and finished fabrics must **be steam or water damped** and **hot-press ironed** to remove the creases and to flatten the surface so as to avoid difference of color reflectance by different surface(due to creases) , even if the same fabrics for testing

- Use the same fabrics finished **in the same flat surface**, when the test is done to see **Colour deepening** effect

- Fabrics of different varieties of construction in yarns, weaving and finishing make the **Colour deepening** effect different inspite of the same **Colour deepening Agent** used at equal dosage and similar process

Precaution Manual for XL Bloom Series

B. <u>Control and care for dyeing and after-treatment of dyed fabrics before treating it with Colour Deepening Agent in padding</u>

- ❖ Black dyestuff quality recommended to dye polyester fabrics
- ❖ Fastness properties(washing & rubbing) of fabric after dyeing should be atleast 3-4 ratings
- ❖ Dyed fabric must be properly soaped, free from residual alkali & anionic auxiliaries used in soaping. There should not be any re-deposited dyestuff on the fabrics. The fabric pH must be adjusted to be in the pH acid: 5.5 – 6.5

C. <u>Precautions to be taken while preparing Colour Deepening Agent bath:</u>

- ❖ Water used for diluting **<u>Colour Deepening Agent</u>** must be softened by ion exchange and pH: 6.8 to 7.2. If water is hard the emulsion will break & will lead to polymeric sticky particles.

Precaution Manual for XL Bloom Series

4. **Chemical And Machanical control and care taken to pad colour Deepeningagent and other chemical solution on fabrics**

- ❖ pH control is the most important chemical control in padding solution to keep Colour deepening agent stable in bath and for effective color deepening effect.
- ❖ Colour deepening agent is generally applied in acid pH. But, during the padding operation, the pH of the padding solution is raised by pH:1 by fabrics due to residual alkali chemical bought in from fabric.
- ❖ It is recommended to keep the pH of padding solution between 5.0 - 5.5, so that slight alkali brought in to the solution by dyed fabrics get neutralized & pH do not exceed towards alkaline side & hence emulsion remains stable & risks for weaker color deepening results and white specks to come gets avoided.
- ❖ If pH is lower 4 it weakens color deepening effect . Ideal pH is 5.0 - 5.5
- ❖ When the pH of the padding solution during padding goes to pH:7, it is better to check the after treatment process of the fabric

5. **Padding bath control to reduce the tailing problem**

   What is tailing problem? Faster adsorption of colour deepening agent into fabrics during padding operation makes the concentration of colour deepening agent in the padding solution less which causes tailing problem (i.e. on long running fabric processed last pickups less colour deepening agent & tailing occurs)

   How to solve the tailing problem. To make the pad solution volume small for faster exchange of pad chemicals by new chemicals

Precaution Manual for XL Bloom Series

To start feeding a fresh **Colour deepening agent** solution to the pad bath & to keep the solution amount level constant in the bath all the time of the padding operation.

Depending on fabric constructions and padding mangle design, initial running meter of fabrics gets very fast adsorption of **Colour deepening agent** and are darker. Recommended is to dilute the solution by adding 20 % of soft water in to the padding bath

Precaution Manual for XL Bloom Series

6. Initial test to see the efficacy standard of Colour deepening agent

- Drop 0.2 to 0.4 cc of water by syringe on a **Colour deepening agent** treated fabrics. If the treated fabrics do not let the water drops absorbed within 10 minutes, it is accepted as standard treated fabrics.

7. Drying and curing standard of Colour deepening treated fabrics by padding

- Standard drying temperature: 110°C to 130°C

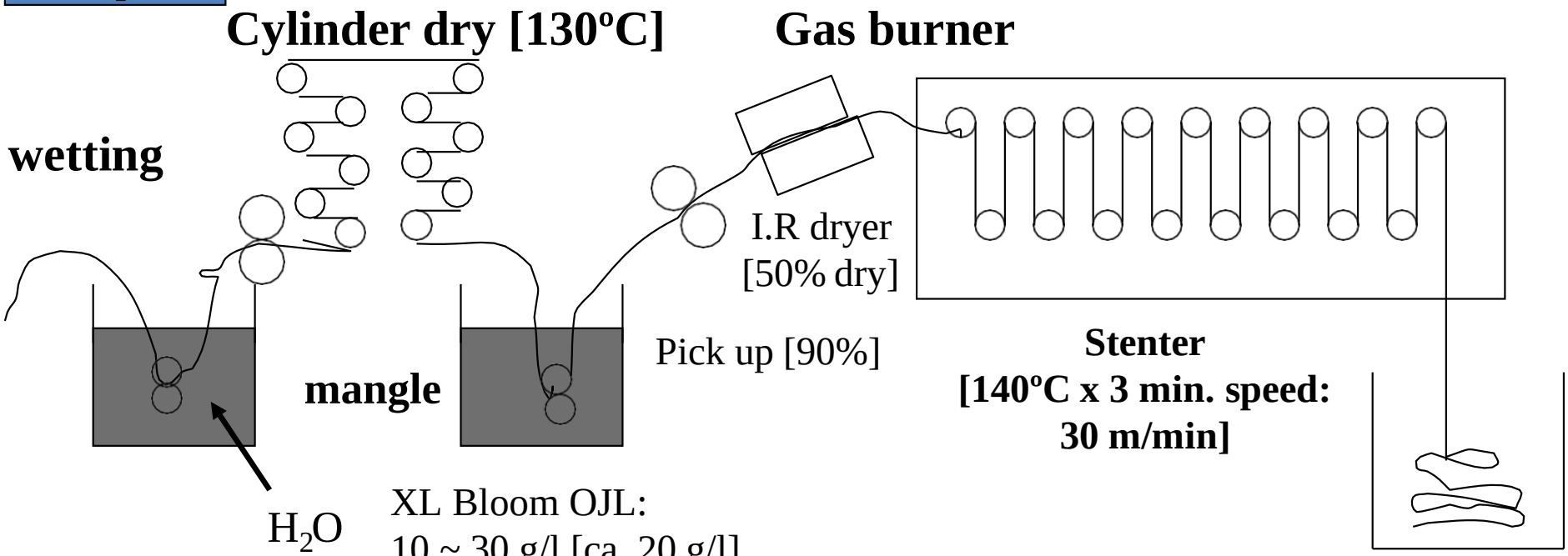
The fabrics dried below 100°C gets deeper in color , but have an un-level and un-even treatment.

Standard curing temperature: **175°C for 45 seconds** to **185°C for 30 seconds**

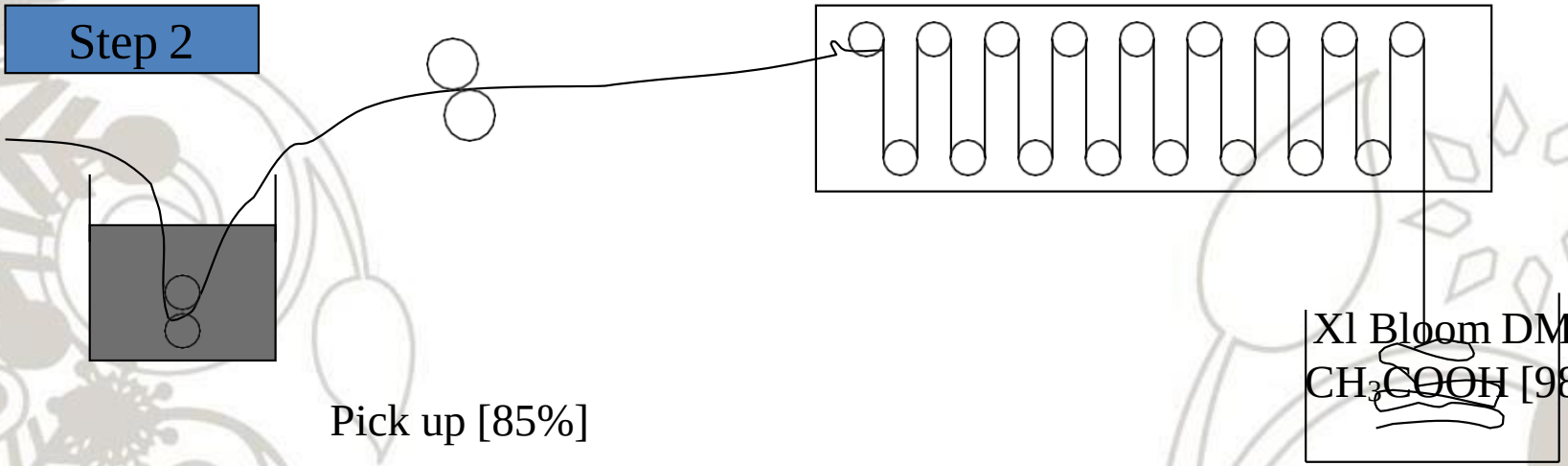
The color deepening effect is most stable at the above drying and curing temperature:

Application

Step 1



Step 2



XL Bloom Overview

- XL DEEP BLOOM: Resin based color bloomer with redder tone.
- XL DEEP BLUE: Resin based color bloomer with bluer tone.
- XL BRIGHT ONE: Resin based color bloomer with brighter tone.
- XL BLOOM SSB: Resin based bloomer with redder tone, specially developed for burqa fabric.
- XL BLOOM SBT: Resin based bloomer with bluer tone, specially developed for burqa fabric.
- XL Soft Bloom: Economical silicone softener compatible with resin based color bloomer which do not change tone.
- XL DMP: Silicone softener compatible with resin based color bloomer which do not change tone.
- XL Bloom-Black: Silicone polyurethane based color deepener with neutral tone.
- XL Bloom- CVI: Silicone softener based color deepener with redder tone.