
ecoresource
Modern colour solution

Natural colours, plant extracts, colouring foods.

The 5 reasons to change from synthetic to natural.

- ✔ New regulations of food production and labeling are evolving and improving;
- ✔ The ingredients and composition of food are under growing concern by the public and media;
- ✔ Consumers want to know what they eat and are cautious of unknown names;
- ✔ Safety studies are showing natural food is healthier;
- ✔ Natural ingredients ensure a better product and a stronger company image to be ahead of competition.

"The Southampton Six" *
Synthetic colors to replace first

- ✔ Allura Red (E129)
- ✔ Ponceau 4R (E124)
- ✔ Tartrazine (E102)
- ✔ Sunset Yellow (E110)
- ✔ Quinoline Yellow (E104)
- ✔ Carmoisine (E122)

* - As the results of a 2007 study at the University of Southhampton, UK. These synthetic azo-dyes have been found as causing hyperactivity and reduced attention of children.

Choosing natural options to replace synthetic colors is a complex process.

The main challenges to consider are, but not only:

- ✔ To choose the right color and shade;
- ✔ To insure the quality and safety of product through all shelf life;
- ✔ To guarantee stability of color in the product, incl. light fastness, heat stability, pH, etc.

COLOUR SOLUTIONS FOR BEVERAGES

Soft drinks – water solutions of mixtures of sugar syrup, fruit juices, natural extracts from fruits, berries, food flavourings and citric acid, caramel and other raw materials

Types of soft drinks:

- juice-based (juice-containing – at least 10% of juice, fruit drinks -15-25% of juice/puree);
- nectars (25-50% of juice/puree), 100% juices (reconstitued or pressed directly);
- plant-based;
- flavoured waters;
- special applications

Alcoholic beverages – made by mixing of alcohol, treated water and alcoholized herbal infusions, juices, aromatic alcohol, essential oils, sugar syrups, citric acid, colours and other ingredients

Types of alcoholic beverages:

- punch;
- dessert beverages;
- aperitifs; balsams; cocktails; gins;
- liqueurs

Natural colours

- E-code
- Other additives (solvents, emulsifiers, preservatives, etc)
- Production method (synthesys, catalyzors)

Carmine E120

AQUANAT™ Carmine water-soluble or water-dispersible

Characteristics

- ✔ derived from cochineal (Coccus cacti)
- ✔ stable at pH 3,0-7,0
- ✔ shades from red to lilac
- ✔ not soluble in oil and water
- ✔ light, heat, oxygen, alchohol stability

Anthocyanin E163

ECOTAN™ Anthocyanin

Characteristics

- ✔ derived from grapes, black carrot, black currant, red cabbage, elderberry
- ✔ shades from pink to red
- ✔ water-soluble
- ✔ stable at pH 2,5 – 4,0
- ✔ less stable with ascorbic acid
- ✔ metal ions can influence anthocyanin shades: Ferrum ions can impart scarlet colour, Magnesium and Calcium ions can add dark-blue.

Shade «Raspberry»
AQUANAT Carmine 0045

Shade «Raspberry»
MIXROME Red 0211

Shade «Barberry»
AQUANAT Carmine 0328

Shade «Strawberry»
ECOTAN Anthocyanin 0029/2

Shade «Wild berry»

Shade «Black currant»

ECOTAN Anthocyanin 0033D

Shade «Orange»
AQUANAT
Carmine 0289

Shade «Pineapple» (clouded)
ECOPLANT Extract Yellow
0278/1 WS

Sodium copper chlorophyll (E141)

AQUANAT™ Chlorophyll

Characteristics

✔ derived from edible plants and herbs, luminaria, lucerne or nettle by solvent extraction
✔ different shades of green
✔ water-soluble
✔ high stability to light and heat
✔ acid stable

Shade «Green apple»
AQUANAT Chlorophyll 0227

Shade «Estragon»
MIXROME
Estragon 0279

Shade «Estragon»
MIXROME
Estragon 0296

Shade «Estragon»
ECOPLANT extract green
0373 PWS

Shade «Green tea» **Shade «Lime»**

ECOPLANT extract green 0348 PWS

Shade «Green apple»

MIXROME Green apple 0280

Stability of natural colours

Colour	Name	Heat stability, ºC	Light stability (according to 5-points scale)
	Sodium copper chlorophyllin	120	4
	Anthocyanin	100	4
	Beta-carotene	120	3
	Carmine	150	5

Raspberry	AQUANAT Carmine 0045	Carmine E120	0,1 – 0,2
Wild berry	ECOTAN Anthocyanin 0033D	Anthocyanin E163	0,1 – 0,2
Strawberry	ECOTAN Anthocyanin 0029/2	Anthocyanin E163	0,1 – 0,2
	Black carrot juice concentrate	Black carrot juice concentrate	0,2 – 0,4
Orange	AQUANAT Carmine 0289	Carmine E120	0,05 – 0,2
Green apple	AQUANAT Chlorophyll 0227	Sodium copper chlorophyllin E141ii	0,02 – 0,04

* Recommended at pH = 2 – 3,5

Natural plant extracts

- ✔ E-code free
- ✔ Dosages are not limitated
- ✔ Produced from edible vegetables, fruits, plants and seaweed etc.
- Traditional food preparation process

Safflower

Black carrot

Genipa

Red cabbage

Sourcing of
Natural extracts «ECOPLANT»

Colour shade	Product name	Composition
	ECOPLANT Extract Yellow 0278 WS	Safflower extract
	ECOPLANT Extract Red 0298 WS	Safflower extract + Black carrot juice concentrate
	ECOPLANT Extract Red 0302 WS	Red cabbage extract
	ECOPLANT Extract Blue 0304 WS	Genipa extract
	ECOPLANT Extract Purple 0305 WS	Genipa extract + Black carrot juice concentrate
	ECOPLANT Extract Purple 0305/1 WS	Genipa extract + Red cabbage extract
	ECOPLANT Extract Green 0348 P WS	Genipa extract + Safflower extract
	ECOPLANT Extract Green 0373 P WS	Genipa extract + Safflower extract

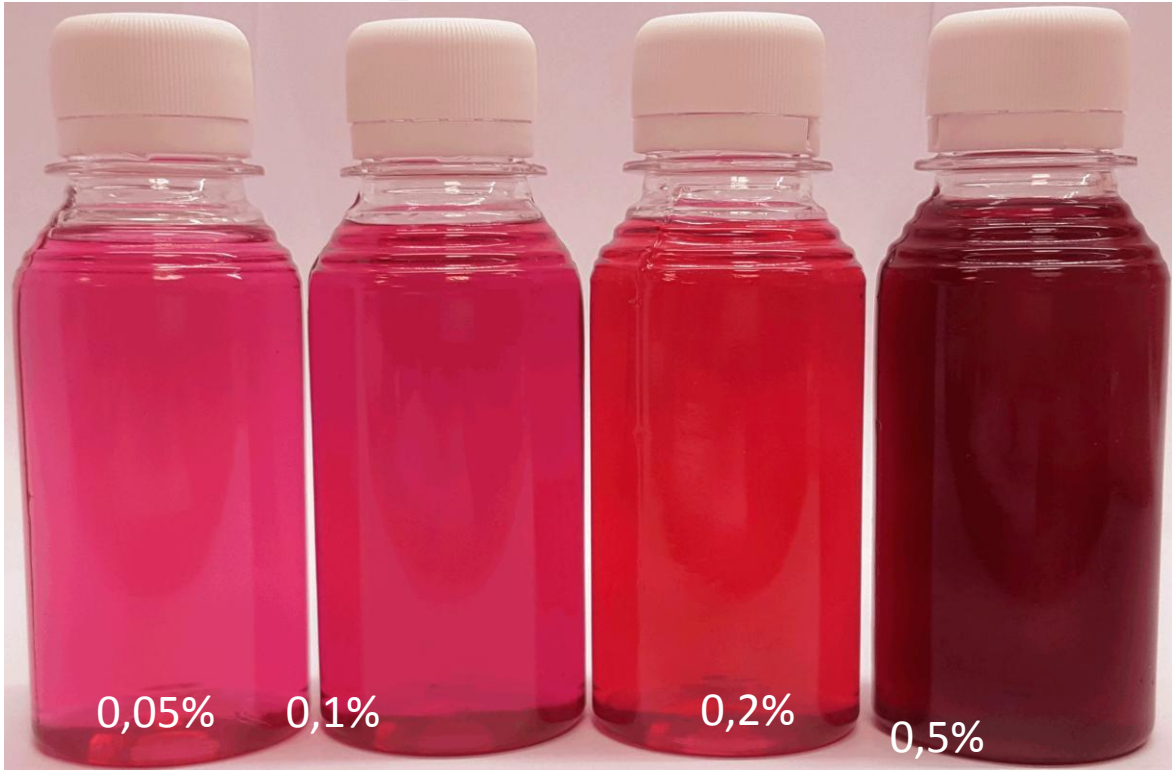
Characteristics

Colour	Name	Heat stability, ºC	Light stability (according to 5-points scale)	pH
	ECOPLANT Extract Yellow 0278 WS	220	excellent	2-7
	ECOPLANT Extract Red 0298 WS	220	good	3-5
	ECOPLANT Extract Red 0302 WS	220	good	2-5
	ECOPLANT Extract Blue 0304 WS	100	good	3-5
	ECOPLANT Extract Purple 0305 WS	100	good	3-5
	ECOPLANT Extract Green 0348 P WS	100	good	3-5
	ECOPLANT Extract Green 0373 P WS	100	good	3-5

Natural extracts «ECOPLANT»

Colour	Name	Composition	Dosage, %
Raspberry	ECOPLANT Extract Red 0302 WS	Red cabbage extract	0,05 – 0,2
Strawberry	ECOPLANT Extract Red 0298 WS	**Black carrot juice concentrate** + Safflower extract	0,2 – 0,4
Wild berry	ECOPLANT Extract Purple 0305 WS	**Black carrot juice concentrate** + Genipa extract	0,1 – 0,3
Lemon	ECOPLANT Extract Yellow 0278 WS	Safflower extract	0,1 – 0,2
Green apple	ECOPLANT Extract Green 0348 PWS	Safflower extract + Genipa extract	0,01 – 0,03
Estragon	ECOPLANT Extract Green 0373 PWS	Safflower extract + Genipa extract	0,01 – 0,02
Dark blue	ECOPLANT Extract Blue 0304 WS	Genipa extract	0,05 – 0,1
	ECOPLANT Extract Blue 0303 PWS	Genipa extract	0,01 – 0,05

* Recommended at pH = 2 – 3,5. For drinks with the extract genipa – pH = 3,2 – 3 ,5



Shade «Raspberry»

Shade «Cherry»

ECOPLANT Extract Red **0302WS**

Shade «Strawberry»

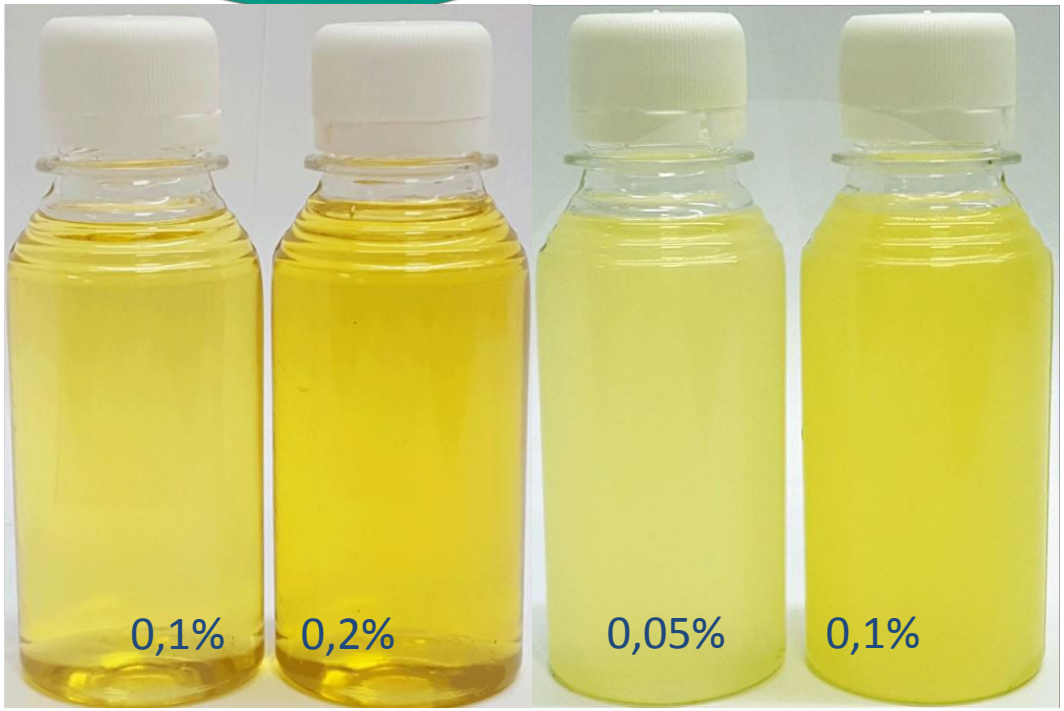
ECOPLANT Extract Red 0298 WS

Shade «Wild berry»

Shade «Black currant»

Shade «Red grapes»

ECOPLANT Extract Purple **0305 WS**



Shade «Lemon»
ECOPLANT Extract Yellow
0278 WS

Shade «Lemon» (clouded)
ECOPLANT Extract Yellow
0278/1 WS

Genipa plant extract

- Edible fruit From South America
- Once oxidized its juice turns blue
- E-code free

Dosages are not limited

Genipa plant extract

Description	• Fine dark blue powder
Properties	• Water soluble • Gives colour from light blue to dark blue • High stability to light • High stability to heating • Stable at pH 3,0-8,0
Application segments	• Beverages (soft, low-alcoholic, juice-based) • Dairy, ice-cream • Confectionery (candies, chewing-gums, wafers, cookies) • Jams, jelly, mousses

Loss of colour versus PH characteristic response of 0,05% water solution of Genipa plant extract

pH 2 pH 3 pH 4 pH 7 pH 8 pH 9

Shade «Blue ice»

ECOPLANT Extract Blue **0304 WS**

Colouring foods

- Clean labelling
- Edible fruits, vegetables, flowers, algae etc. as raw materials
- Traditional food preparation process
- No synthetic additives inside
- Contain only foods as ingredients – salt, sugar, starch etc.

Black carrot juice concentrate

- Belongs to natural colouring foods, E-code free
- Made from black carrot (Daucuscarota L) from Turkey and other Asian countries
- Contains Anthocyanins (mostly cyanidin) responsible for purple-black colour, and carotenoids in less concentration
- Light and heat stable
- Gives red colour to products
- Is stable at pH=2,5÷4

Shade «Strawberry»

Black carrot juice concentrate

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