

# Colours

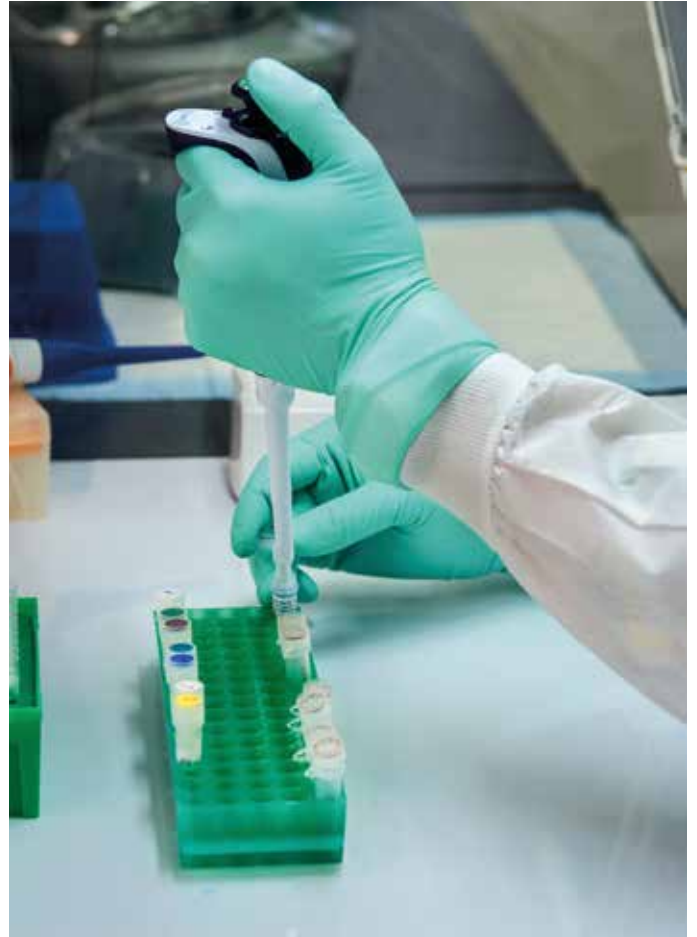


# WHY PLANT-EX?

Established in 2010 and boasting an industry experience of more than 25 years, the Plant-Ex team have developed a portfolio of ingredients which are supplied into the food and feed industry across the globe. Individual development laboratories combined with experience of a multitude of different applications means that the organisation knows how to deliver a product that performs.

**Taste, colour and function** are critical elements in nutrition for both humans and animals. Our expertise spans the three subjects and our factories and raw material routes are well placed to give customers and their animals the best options that nature can offer.

Taste	Pallatability, flavour and preference
Colour	Appearance, differentiation and brand value
Function	Nutrition, shelf life and health



\*Talk to our team about legislatively compliant options with supportive studies assured to assist in the development of great products for our charges in the animal population.

# NATURAL COLOURS & COLOURING FOODSTUFFS

## Available In Powders, Liquid & Paste Form

Years of experience in the natural colours sector, combined with a development team curious to explore how the stability and performance of colours can be enhanced, mean that Plant-Ex has a knowledge base which is unrivalled in the industry.

Creation of micro-milled pastes, beverage stable emulsions and bespoke spray dried powders are some of the specialised products that have been created by the team.

Colouring foodstuffs also comprise a large proportion of the portfolio supplied by Plant-Ex, meaning that the colours division are ready to offer a complete selection of options to customers, regardless of the application.



[WWW.PLANT-EX.COM](http://WWW.PLANT-EX.COM)  
VISIT OUR WEBSITE TO GET MORE INFORMATION

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## NATURAL COLOURS



- Regulation (EC) No. 1333/2008 on food additives, uses and labelling.
- The annexes of Regulation (EC) No. 1333/2008 contain food categories and a positive list of colours permitted in the EU including maximum quantities and instructions for use.
- Regulation (EU) No. 231/2012 lays down the specifications for food additives listed in Annexes II and III to Regulation (EC) No. 1333/2008.

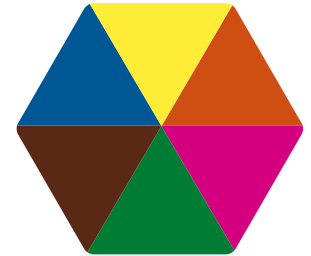
-Where a natural colour is used its function must be declared on the product labelling, for example, 'colour: E160a', or 'colour: Beta Carotene'.

-E120, E141, E150 (c-d) E171 and E172 are deemed by legislation to have undergone too great a level of processing to be classed as Natural Colours and are therefore, whilst derived from natural sources, are not permitted to be labelled as Natural Colour

### NATURAL COLOUR PORTFOLIO

	Carotenes E160a (i) Synthetic, (ii) Natural Mixed Palm, (iii) Natural Blakeslea Trispora, (iv) Natural Algal Dun Salina		
	E162 Red Beet		E161b Lutein
	Paprika E160c		Anthocyanins E163
	Curcumin E100		Titanium Dioxide E171
	Carmine E120		Caramels E150a, b, c, d
			Chlorophyllins E141
			Chlorophyll E140
			Annatto E160b
			Carbon Black E153

## COLOURING FOODSTUFFS



Colouring foods are considered “Clean label” ingredients and offer an alternative to using colours as food additives in a wide variety of food applications, they appeal to producers/customers who want a food product which is based on ingredients that consumers can easily relate to.

### COLOURING FOODSTUFF PORTFOLIO



Red Beet



Safflower



Black Carrot



Burnt Sugar



Radish



Spirulina



Red Cabbage



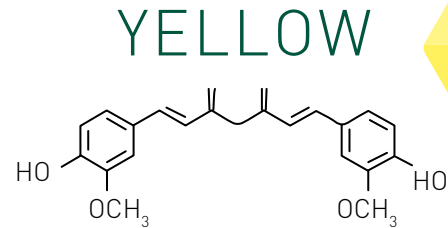
Malt



Purple Sweet Potato



For more info on Colouring Foodstuffs and Natural Colours please contact our Team to get the technical sheets of each



## CURCUMIN E100

**Origin:** Curcumin is a naturally occurring pigment extracted from the roots of the Turmeric plant.

**Profile:** A warm, earthy flavour and bright yellow colour.

**Formats:** The oleoresin contains up to 30% Curcuminoids and can be made oil or water soluble and can also be spray dried.

**Stability:** Turmeric/Curcumin has good heat stability but is not stable to light. **(Light stability can be increased on Demand)**

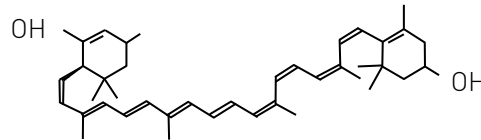
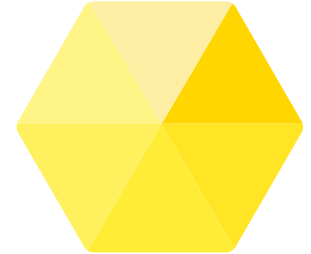


## Applications:

- Cereals
- Beverages
- Bakery
- Dairy
- Popcorn
- Ice Cream
- Confectionery
- Snacks
- Seasoning



YELLOW



## LUTEIN E161B

**Origin:** Extracted from the flowers of the Marigold plant *Tagetes erecta*.

**Profile:** Lutein provides a warm, lemon yellow colour at lower dosages with a more orange hue at higher dosages.

**Formats:** Available in both oil and water-soluble liquid formats, as well as water soluble, spray dried powder.

**Stability:** It has good stability to heat and light, with a pH range of 3 – 8.

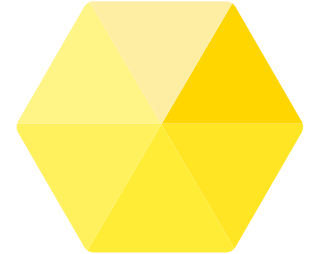
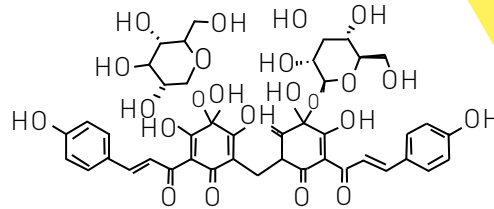


### Applications:

- Functional foods
- Biscuits
- Beverages (Tropical especially)
- Sugar Confectionery
- Sauces
- Cheese



## YELLOW



### SAFFLOWER

**Origin:** Extracted from the plant *Carthamus tinctorius*.

**Profile:** Safflower produces a clear, bright yellow colour with a mild, honey-like flavour.

**Formats:** Available in water soluble liquid formats, or spray dried into a water-soluble powder.

**Stability:** Safflower has excellent stability to heat and light with a pH range of 3 – 8.



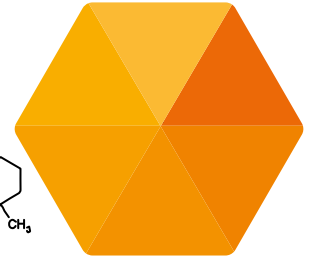
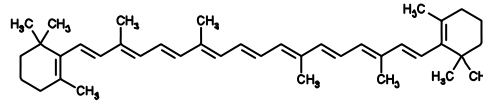
**Applications:**

- Liquorice / Black Sweets
- Toothpaste
- Ice Cream & Cones
- Health Drinks
- Bakery
- Detox Capsules





## ORANGE



### CAROTENES E160A

**Origin:** Carotenes are extracted from fungi, plants, vegetables and fruits, but can also be produced synthetically.

- (i) Synthetic
- (ii) Mixed Palm (RSPO Certified)
- (iii) Fungal (Blakeslea Trispora)
- (iv) Algal

**Profile:** Used to add yellow and orange tones.

**Formats:** Also available as spray dried, water soluble powder and in oil soluble formats.

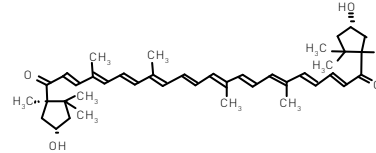
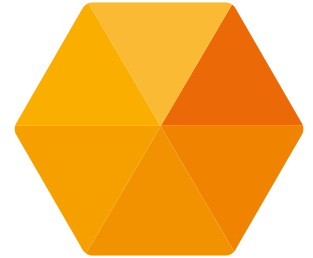
**Stability:** Excellent heat and pH stability and can be stabilised to light with the addition of natural antioxidants.

### Applications:

- Bakery
- Sports nutrition
- Confectionery
- Dairy
- Fat based applications (ice cream and margarine)



## ORANGE



### PAPRIKA E160C

**Origin:** Extract with a high concentration of Capsanthin and Capsurobin, made from the dried fruits of the sweet Bell Pepper plant: *Capsicum annum*.

**Profile:** A natural orange colour.

**Formats:** Available in both oil and water-soluble liquids and Spray dried powder is also available to give a vibrant orange colour

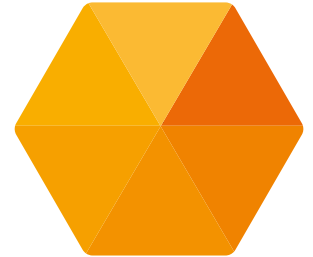
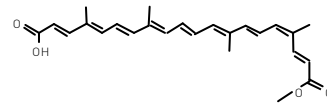
**Stability:** When blended with natural antioxidants, Paprika has good heat and light stability, with a pH range of 3 – 8.

### Applications:

Bakery  
Confectionery  
Dairy  
Fat based applications (ice cream and margarine)  
Sauces  
Meat Products & Sea-Foods  
Sports Nutrition  
Seasonings



## ORANGE



### ANNATTO E160B

**Origin:** Derived from the seeds of the Achiote tree Bixa Orellana.

**Profile:** Orange red shades.

**Formats:** Annatto is available in oil or water-soluble formats, as well as a spray dried powder.

**Stability:** Annatto has good stability towards heat and light stability which can be increased with antioxidants.

#### **Applications:**

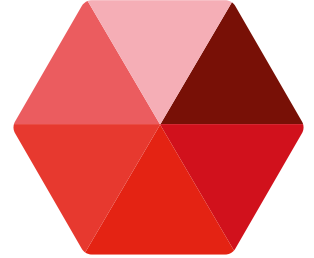
Bakery  
Confectionery  
Beverages  
Snacks  
Seasonings



Amendments made under EU Regulation 2020/771 mean Annatto must now be classified as:  
Annatto: Bixin [E160b (i)]  
Annatto: Norbixin [E160b (ii)]

Plant-Ex is **fully compliant** with EU Regulation 2020/771 offering a complete portfolio of Annatto based colours ready for the implemented change in January 2021.

RED



## ANTHOCYANINS



### BLACK CARROT

**Origin:** Botanical source – *Daucus carota*.

**Profile:** Deep red colour.



### RADISH

**Origin:** Botanical source – *Raphanus raphinistrum*.

**Profile:** Radish produces a bright red-orange colour in low pH, turning pinker in neutral applications.

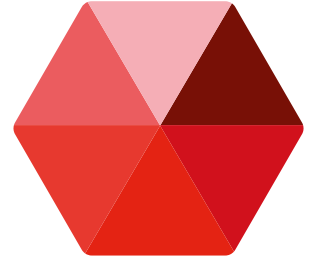


### RED CABBAGE

**Origin:** Botanical source – *Brassica oleracea*.

**Profile:** Produce a reddish pink hue in acidic applications, turning blue in neutral applications.

RED



## ANTHOCYANINS



### PURPLE SWEET POTATO

**Origin:** Botanical source – Ipomoea batatas.

**Profile:** Produce a vibrant pink colour in acidic applications, turning purple violet.



### ELDERBERRY

**Origin:** Botanical source – Sambucus.

**Profile:** Create a reddish-purple hue in acidic food applications.

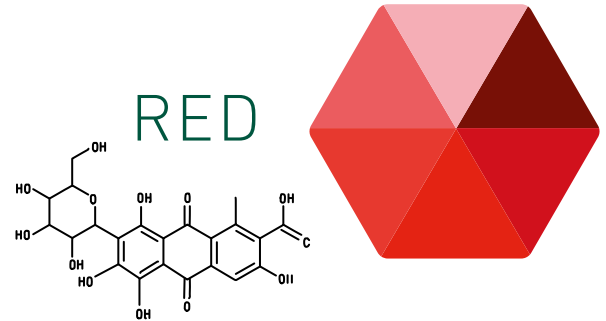


### GRAPE SKIN

**Origin:** Botanical source – Vitis vinefera.

**Profile:** Produces a dark berry like red colour in acidic applications.

Note: A by-product of the wine making industry, Grapeskin Extract carries an allergen declaration for Sulphur Dioxide.



## CARMINE E120

**Origin:** Derived from the female Cochineal beetle *Dactylopius coccus*, a parasite that feeds on the Prickly Pear cactus.

**Profile:** A bright pink-red.

**Formats:** Available in both oil and water-soluble liquids, as well as spray dried into a water-soluble powder.

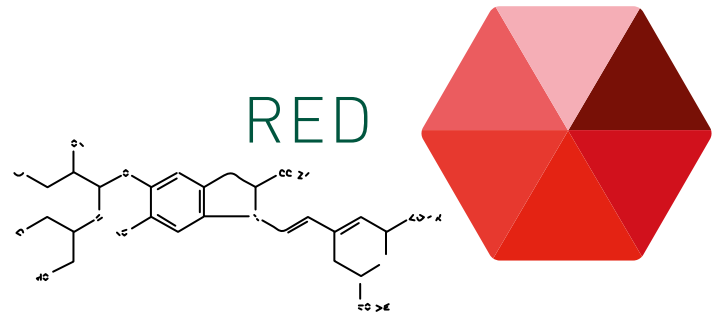
**Stability:** A highly stable deep red colour with excellent stability to light and heat.



### Applications:

Dairy / Ice Cream  
Cosmetics  
Meats  
Bakery  
Confectionery





## RED BEET

**Origin:** Made from the juice of Red Beetroots *Beta vulgaris*.

**Profile:** It is used to create vibrant pink to red shades.

**Formats:** Available as water soluble liquids and as a spray dried water-soluble powder.

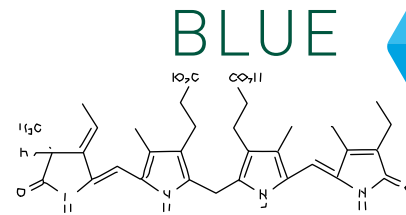
**Stability:** Red Beet has limited heat and light stability and is ideally suited for use in low temperature processed food applications with a pH range of 4 – 7.



## Applications:

Functional foods -  
Sports Nutrition  
Biscuits  
Beverages  
Some Confectionery  
Sauces  
Icings/ Decorations





## SPIRULINA

**Origin:** Derived from *Arthrospira platensis*, a type of Blue Green algae known as Cyanobacteria.

**Profile:** Spirulina is a widely used option for achieving clean label blue, green and violet shades.

**Formats:** Available as water soluble liquid, water soluble powder, and oil soluble liquid.

**Stability:** Has limited heat and acid stability so must be used carefully processed to avoid damaging the pigment



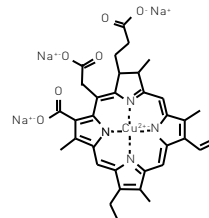
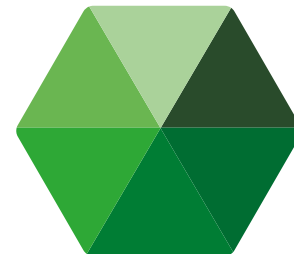
## Applications:

Confectionery  
Sports nutrition  
Decorating cakes  
Bakery products





GREEN



## CHLOROPHYLL E140

**Origin:** It is primarily sourced from plants such as Grass, Spinach & Alfalfa.

**Profile:** Yellow-green pigment.

**Formats:** Available as water soluble liquid, water soluble powder, and oil soluble liquid.

**Stability:** has limited heat and acid stability so must be used carefully processed to avoid damaging the pigment.

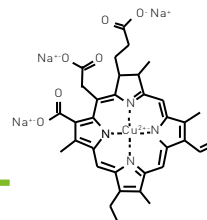
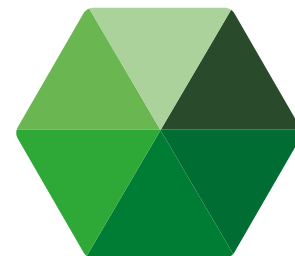


## Applications:

Dairy / Ice Cream  
Snacks  
Confectionery  
Bakery  
Soap / Shower Gel  
Cosmetics



GREEN



## E141 (I) COPPER CHLOROPHYLL

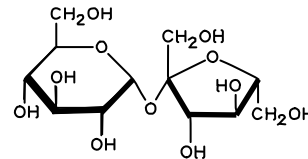
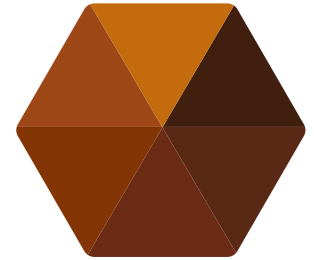
Copper Chlorophyll is a semi-synthetic derivative of Chlorophyll which has been reacted with Copper to create an oil-soluble pigment with **ENHANCED STABILITY** and a **bold, green colour**. Typically an oil soluble liquid, Copper Chlorophyll can also be made water soluble through the use of permitted emulsifiers. It is also commonly blended with yellow colours



## E141 (II) SODIUM COPPER CHLOROPHYLLIN

Sodium Copper Chlorophyllin is a semi-synthetic derivative of Chlorophyll which has been reacted with Sodium salts to create a **dark green** water-soluble pigment with **EXCELLENT HEAT AND LIGHT STABILITY**. It is widely used in the confectionery industry for its rich and intense green colour. Typically providing more of a blue/green shade, Copper Chlorophyllin can be blended with yellow colours to make a range of green shades from Pistachio or Kiwi to Aqua Marine and Mints.

## BROWN



### BURNT SUGAR

**Origin:** Burnt sugar is a Caramel formed by the controlled heating of food sugars without the addition of other ingredients.

**Profile:** Utilising the Maillard Reaction, Burnt Sugar is used to give produce brown shades.

**Formats:** Available as water soluble liquid, water soluble powder, and oil soluble liquid.

**Stability:** Burnt sugar has very good heat and light stability.

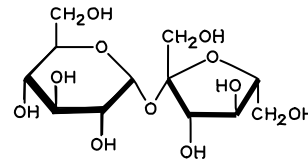
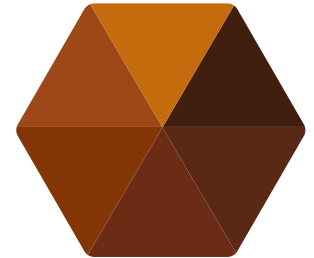


### Applications:

- Confectionery
- Beverages
- Dairy
- Glazings & Fillers
- Bakery
- Alcohol



## BROWN



### MALT EXTRACT

**Origin:** Formed by the controlled heating of food sugars without the addition of other ingredients.

**Profile:** For more intense, darker shades of brown.

**Formats:** Available as a liquid or powders.

**Stability:** Good heat and light stability.

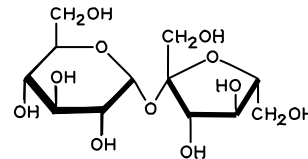
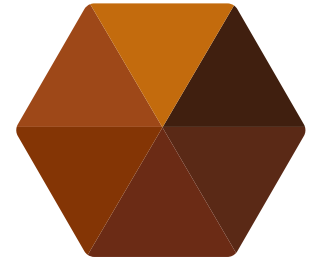
### Applications:

Confectionery  
Beverages  
Dairy  
Glazings & Fillers  
Bakery  
Alcohol  
Seasonings



Note: Malt is extracted from Barley, and whilst the gluten level is low and often undetectable, the product carries an Allergen declaration

## BROWN



## CARAMEL

**E150A PLAIN CARAMEL, OR BURNT SUGAR** - a Caramel formed by the controlled heating of food sugars without the addition of other ingredients, Burnt Sugar can provide **warm yellows and soft brown** shades as well as adding a typical Caramel flavour. It can be used in a **wide range of applications** from confectionery, to snacks, bakery and sports nutrition. For more intense, darker shades of brown, it is possible to use Caramel colours which are produced from food sugars and reacted with various stabilising ingredients to **enhance the colour intensity and stability**.

**E150B CAUSTIC SULPHITE CARAMEL** obtained through controlled heat treatment of carbohydrates in the presence of sulphite compounds, it provides a mild colour and flavour with a strong red shade and is used in alcoholic beverages.

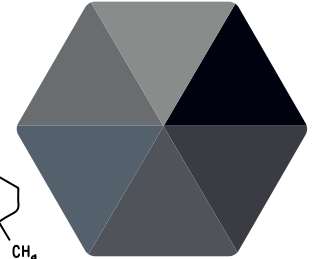
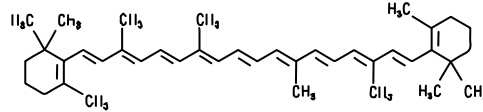
**E150C AMMONIA CARAMEL** is used for a Brown-yellow colour and is ideally suited for use in Beers, drinks, and sauces.

**E150D SULPHITE AMMONIA CARAMEL** is the darkest Caramel and is primarily used in soft drinks and pet food applications.

**Available as a liquid or powders.**

EU Labelling declaration: Colour: Caramel, Colour: E150a, b, c, d.

BLACK



## CARBON BLACK E153

**Origin:** Carbon Black is a black colour produced through the burning of plant material such as Coconut Shells and Peat.

**Profile:** For more intense, darker shades of brown.

**Formats:** Available as a liquid, paste or powders.

**Stability:** Carbon Black is extremely heat and lightstable.

**Applications:**  
Liquorice / Black Sweets  
Toothpaste  
Ice Cream & Cones  
Health Drinks  
Bakery  
Detox Capsules



WHITE



## TITANIUM DIOXIDE E171

**Origin:** Titanium Dioxide is manufactured from the ores Limenite or Rutile.

**Profile:** A naturally occurring white colour.

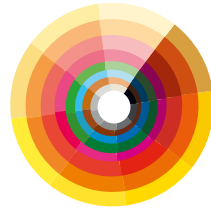
**Formats:** Available as water/oil dispersible powder, water dispersible liquid suspension, and oil dispersible liquid.

**Stability:** has excellent heat and light stability.

### Applications:

Active ingredient in Sunscreen  
Bakery  
Ice cream  
Cosmetics  
Confectionery  
Toothpaste  
Coatings  
Chewing Gum





## COLOUR MATCHING

The Key to successful matching is the use of our Colorimetry lab and Spectrophotometry to ascertain the target. Then dedication, time and long years of experience to create the perfect match.

We will then check the Customer's application to ensure that the option provided is the most suitable.

Our work is an exciting mix of knowing that we are a team of experts completing serious work for clients, combined with continuous learning as we strive for new and better colours.





## OUR CAPABILITIES

### Processing:

By combining high quality ingredients with our in house manufacturing techniques and expertise, Plant-Ex can enhance and stabilise colours to provide brilliant intensity as well unrivalled stability in a wide range of food and beverage applications.

### SPRAY DRYING

is the process of turning a liquid, syrup or paste into a fine powder. Spray drying involves mixing liquid ingredients with carriers such as Maltodextrin, and then spraying them at high pressure into a column of hot air to evaporate the water and collect the dried powder via a cyclone. Spray drying can be used to improve the handling of troublesome or messy products such as Honey and Treacle, while also extending the shelf life and storage requirements for short shelf life products such as fruit and vegetable juices. The advantages of spray drying also include: improved solubility, low hygroscopicity, enhanced colour and free flowing powders.



## OUR CAPABILITIES

### Bead Milling

A machine used to grind solid particles in liquid mediums, such as insoluble colour pigments, to reduce the particle size creating super fine and stable dispersions in liquid and paste forms. Bead milling uses high speed collisions between hard Zirconium beads and the material to be milled to reduce the particle size, and is the most efficient way of producing very fine particle dispersions. The benefit is brighter, more intense colours that are stable in a wide range of applications.



### Homogenising

a homogeniser is used to process liquid emulsions in order to make the particle size of the oil droplets smaller. By forcing the liquid through a small hole at very high pressure, the oil droplets are broken down due to the shear forces exerted on them, resulting in particle size reduction and ultimately a more stable emulsion with a brighter, more intense colour shade. High pressure homogenisation is essential for the creation of beverage stable colours and compounds, with particle sizes  $\leftarrow$  0.5 Microns, typical issues such as neck ringing and flocculation can be prevented by creating high stability emulsions.



Innovation  
**naturally**

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