



NATURAL COLORS

CLOSING THE GAP BETWEEN NATURE AND SCIENCE

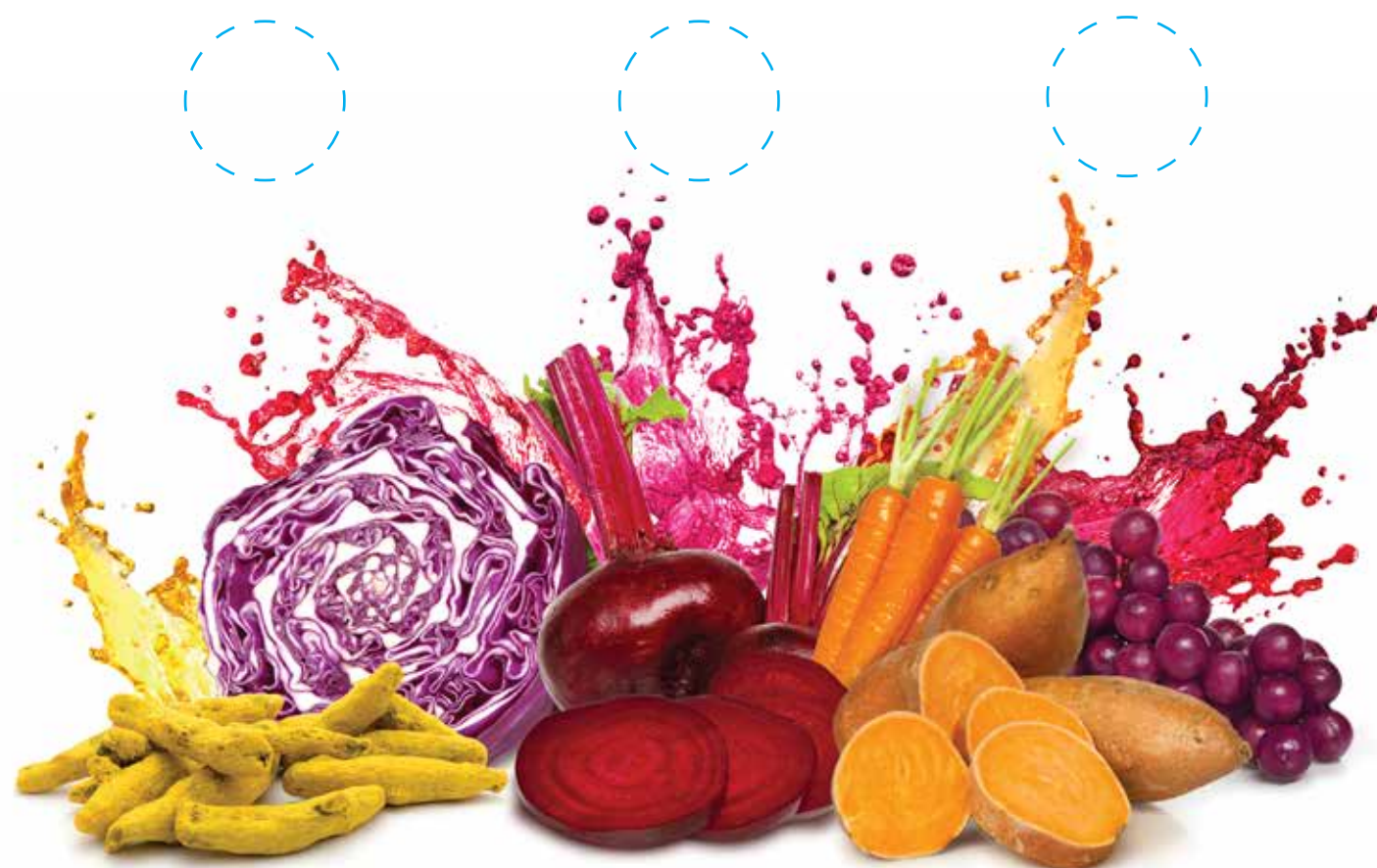


NATURAL COLORS

CLOSING THE GAP BETWEEN NATURAL COLOR SCIENCE
AND CERTIFIED COLOR TECHNOLOGY EVERY DAY

Naturally derived and creatively applied, Sensient Natural Colors unite nature's bountiful resources with unparalleled expertise in color science and formulation, capturing an unprecedented spectrum of natural color that meets the clean label, health and wellness desires of the ever-changing global consumer.

Sensient delivers the ultimate color flexibility, with customized specific shade and attribute requirements. We use our unparalleled technical expertise to harness nature's resources and create vibrant colors that define and protect brands. Through our strategic global presence, we are able to ensure safety throughout a product's entire lifecycle, from harvest to manufacture, resulting in complete product confidence and valuable market opportunities for our customers.



Product Forms

LIQUIDS – Custom-blended liquids offer consistent, dust-free use and increased productivity

POWDERS – Custom blends offer exact shade and strength for batch-to-batch consistency including dust-free, high-strength and carrier-free powders

DISPERSIONS – Shelf-stable dispersions provide consistent dust-free use and improved color flow

ADVANCED EMULSION TECHNOLOGY – Single delivery, shelf-stable emulsions without ring staining and separation problems

MICROFINE™ – Aluminum-free natural color line that simulates Lakes, but remains water-soluble like a dye

ACCUPAK™ – Water-soluble bag that provides a precise pre-weighed color to ensure accuracy and batch-to-batch consistency that is dust-free

DUSTPRO NXT™ – Virtually dust-free natural color powder with improved color solubility, reduced cross-contamination and less cleanup

ASEPTIC PACKAGING - Preservative-free natural colors with enhanced sustainability



Precise Shades

- Custom shade development strengthens brand identity
- Infinite spectrum of shades through advanced blending capabilities
- Multiple formula base alternatives to meet customer specifications, including sugar-free, GMO-free, preservative-free, palm-free, invert sugar and glycerin-based
- Higher pigmentation product through crop development programs and proprietary processing

ABOUT NATURAL COLORS

FDA Definition

A color additive is any dye, pigment or other substance made or obtained from fruit, vegetable, animal, mineral or other source capable of coloring a food, drug, cosmetic or any part of the human body. Natural colors are actually classified by the FDA as “exempt from certification” colors.

Sources

Natural colors come from a variety of sources.

- Seeds like annatto
- Roots such as turmeric
- Vegetables, including black carrots, purple sweet potatoes, cabbages and beet juice concentrate
- Algae like beta carotene
- Insects such as carmine/cochineal
- Fruits including grape color extract, grape skin extract and elderberry

Availability

Many of the color options have restrictions, so careful attention must be given to your color choice. There are defined colors that are permitted for specific applications. For example, although grape skin extract is listed in 21 CFR Subpart A - Foods, it can only be used for coloring beverages. Another example is Tagetes Meal and Extract, which is also listed in Subpart A - Foods. It can only be used as a color in chicken feed.

FOOD USE – 36 colorants

PHARMACEUTICALS – 29 colorants

COSMETICS – 29 colorants

Defining “Natural”

FDA regulations do not consider a colorant from a natural source as “natural” unless the color is “natural” to the food product itself, such as coloring strawberry ice cream with strawberry juice. Adding red beet concentrate from red beets is not considered a “natural” color for strawberry ice cream.

Ingredient Listing

Although the industry often refers to “exempt from certification” colors as “natural” colors, use of this term is prohibited on an ingredient statement. According to 21 CFR section 101.222, several labeling options for “exempt from certification colors” are permitted, to include:

- “colored with ____” (fill in with the color name as described in Part CFR 73)
- “color added”
- “artificial color”
- “artificial color added”

FDA also allows for alternative “equally informative” terms as long as it is clearly indicated that a color has been used. The only exempt from certification colors to require declaration by name are cochineal extract and carmine.

Usage Levels

Most natural colors do not have usage level restrictions. Where there is no usage level restriction, “good manufacturing practices” suffice. As a rule of thumb, do not add more than what gives the intended color effect.

Storage Conditions

As with any product, a tightly sealed container is ideal. Most can be stored between 60°F to 80°F, dependent upon the colorant. We recommend cool storage (refrigerated) for natural colors. Please check the Sensient specification for proper storage conditions.

Kosher and Halal

The majority of natural colors can be certified as Kosher and Halal. Contact our Color Service Lab when working with grape skin extract, or cochineal extract/carmine and related products as they are not mainline Kosher certified.





NATURAL RED

Color dominates taste. Consumer research shows that the color of a food or beverage influences the perceived taste. In fact, sometimes the color has a bigger effect on taste than the source, quality or price of a product.

Red has been known to be an appetite accelerator. It is commonly associated with energy and has been shown to stimulate the senses and raise blood pressure. The color red has been used to promote sports and high physical activity food and beverage products.

Options

- Carmine/cochineal red replacements
- Red 40 replacements
- Red 3 replacements
- Reduced flavor and olfactory impact from vegetable juices
- Red vegetable juices are available that can withstand the presence of high temperatures and lessen the color degradation process
- Azo-free
- Red 3 replacements
 - No color bleeding
- Oil-dispersible and water-dispersible forms available

Regulatory

- Foods – 21 CFR 73.170 – Grape skin extract as a color additive in the U.S. is restricted to use in beverages
- Foods – 21 CFR 73.169 – Grape color extract as a color additive in the U.S. is restricted to non-beverage uses
- Foods – 21 CFR 73.100 – FDA requires the declaration of cochineal extract and carmine by name on the label of all food and cosmetic products that contain these color additives
- Foods – 21 CFR 73.200 – Synthetic iron oxide can be safely used for the coloring of sausage casings intended for human consumption in an amount not exceeding 0.10 percent by weight of the finished food
- Foods – 21 CFR 73.200 – Synthetic iron oxide may be safely used for the coloring of dog and cat foods in an amount not exceeding 0.25 percent by weight of the finished food

SOURCES	STABILITY				PRIMARY APPLICATION					
	pH	Heat	Light	Acid-stable	Beverage	Dairy	Baking	Processed Food	Confection	Pet
Black Carrot	<4.2	Good	Good	Good	●	●		●	●	
Purple Sweet Potato	<4.2	Excellent	Excellent	Excellent	●	●		●	●	
Red Cabbage	<4.2	Excellent	Excellent	Excellent	●	●		●	●	
Red Radish	<4.2	Good	Good	Good	●	●		●	●	
Beet	4.0-7.0	Fair	Good	Poor		●	●	●	●	●
Elderberry	<4.2	Good	Good	Good	●	●		●	●	
Hibiscus	<4.2	Good	Good	Good	●					
Grape Juice	<4.2	Fair	Good	Good	●	●		●	●	
Grape Skin Extract	<4.2	Fair	Good	Good	●					
Carmine	2.5-8.0	Excellent	Excellent	Excellent	●	●	●	●	●	●
Cochineal Extract AP	2.5-8.0	Excellent	Excellent	Excellent	●	●	●	●	●	●
Beta Carotene	2.5-8.0	Excellent	Excellent	Excellent	●	●	●	●	●	●
Lycopene	2.5-8.0	Excellent	Excellent	Excellent	●	●	●	●	●	●
Iron Oxide	2.5-8.0	Excellent	Excellent	Excellent						●

NATURAL ORANGE

It's no secret that the way food looks has an effect on our desire to eat it. Imagine a bowl of orange-colored jelly desserts on the table. How would you expect it to taste, sweet or sour? A little of both?

Orange is recognized as being suitable for everyone and can make products seem more affordable. It embodies wholesomeness and adventure. Orange has very high visibility, so you can use it to catch attention and highlight the most important elements of a product.



Options

- Yellow 6 replacements
- Non-migrating/color bleeding
- Minimized package/equipment staining
- Natural and nature identical sources
- Reduced flavor and olfactory impact from carotenoids
- Clear or opaque
- Azo-free
- Oil-dispersible and water-dispersible forms available

Regulatory

- Foods – 21 CFR 73.75 – Canthaxanthin is limited to 30 milligrams pure/lb of solid or semi-solid food product; or 30 mg/pint of liquid
- Foods – 21 CFR 73.90 – Beta-apo-8' carotenal is limited to 15 milligrams pure/lb of solid or semi-solid food product; or 15 mg/pint of liquid
- Foods – 21 CFR 73.100 – FDA requires the declaration of cochineal extract and carmine by name on the label of all food and cosmetic products that contain these color additives

SOURCES	STABILITY				PRIMARY APPLICATION					
	pH	Heat	Light	Acid-stable	Beverage	Dairy	Baking	Processed Food	Confection	Pet
Beta Carotene	2.5-8.0	Excellent	Excellent	Excellent	●	●	●	●	●	●
Paprika	2.5-8.0	Good	Excellent	Excellent	●	●	●	●	●	●
Carrot Juice (Cardea™)	2.5-8.0	Good	Good	Good	●	●	●	●	●	●
Pumpkin Juice (Cardea™)	2.5-8.0	Good	Good	Good	●	●	●	●	●	●
Canthaxanthin	2.5-8.0	Good	Good	Good	●	●	●	●	●	●
Beta-apo-8'-carotenal	2.5-8.0	Good	Good	Good	●	●	●	●	●	●
Lycopene	2.5-8.0	Excellent	Excellent	Excellent			●	●	●	●
Annatto Water-soluble	5.0-8.0	Good	Fair	Good	●	●	●	●	●	●
Annatto Oil-soluble	N/A	Good	Fair	N/A		●	●	●	●	●
Annatto Acid-proof	2.5-8.0	Good	Fair	Good	●	●	●	●	●	●
Cochineal Extract	<4.0	Excellent	Excellent	Excellent	●	●	●	●	●	●

NATURAL YELLOW

Perception of taste is key. Sight plays an important role in identifying foods and drinks. You don't necessarily have to eat something to know what it is.

Colors can enhance our enjoyment of food. For example margarine is colored yellow to be more appealing to consumers.

Yellow is associated with joy, happiness, creativity and increased energy. It is used to evoke pleasant and cheerful feelings. Yellow tends to disappear into white, so it usually needs a darker color to highlight it.



Options

- Yellow 5 replacements
- Light-stable
- Non-migrating/color bleeding
- Minimized package/equipment staining
- Azo-free
- Clear or opaque
- Reduced flavor and olfactory impact
- Oil-dispersible and water-dispersible forms available

Regulatory

- Foods – 21 CFR 73.200 – Synthetic iron oxide can be safely used for the coloring of sausage casings intended for human consumption in an amount not exceeding 0.10 percent by weight of the finished food
- Foods – 21 CFR 73.200 – Synthetic iron oxide may be safely used for the coloring of dog and cat foods in an amount not exceeding 0.25 percent by weight of the finished food
- Sensient Caramel colors have the average level of 4-Mel listed on their specifications
- Caramel colors can also have sulfites, and sulfite levels are listed on the specifications

SOURCES	STABILITY			PRIMARY APPLICATION						
	pH	Heat	Light	Acid-stable	Beverage	Dairy	Baking	Processed Food	Confection	Pet
Turmeric	2.5-6.5	Good	Poor	Good	●	●	●	●	●	●
Beta Carotene	2.5-8.0	Excellent	Excellent	Excellent	●	●	●	●	●	●
Annatto Water-soluble	5.0-8.0	Good	Fair	Good	●	●	●	●	●	●
Annatto Oil-soluble	N/A	Good	Fair	N/A		●	●	●	●	●
Annatto Acid-proof	2.5-8.0	Good	Fair	Good	●	●	●	●	●	●
Riboflavin	2.5-8.0	Good	Fair	Good	●	●	●	●	●	●
Caramel	2.5-8.0	Good	Good	Good	●	●	●	●	●	●
Iron Oxide	2.5-8.0	Excellent	Excellent	Excellent						●

NATURAL GREEN

While color can be appealing to us visually, a lot more is going on behind the scenes subconsciously. Powerful psychological cues are triggered when we view different colors.

Green has a great healing power; it is the most restful color for the human eye. It balances and refreshes. Green represents nature and health and can be used to promote 'green' products.



Options

- Three unique natural blue sources are available to create green
 - Sensient's Natural Blue vegetable juice
 - Spirulina
 - pH-stabilized vegetable or fruit juice blue
- Copper-chlorophyllin where permitted
- Light-stable
- Reduced flavor and olfactory impact
- Oil-dispersible and water-dispersible forms available

Regulatory

- Foods – 21 CFR 73.530 – Spirulina Extract may be safely used for coloring confections (including candy and chewing gum), frostings, ice cream and frozen desserts, dessert coatings and toppings, beverage mixes and powders, yogurts, custards, puddings, cottage cheese, gelatin, breadcrumbs and ready-to-eat cereals (excluding extruded cereals)
- Sensient's Natural Blue color is labeled "vegetable juice (color)" for finished products under FDA Regulation 21 CFR Section 73.260

SOURCES	STABILITY			PRIMARY APPLICATION						
	pH	Heat	Light	Acid-stable	Beverage	Dairy	Baking	Processed Food	Confection	Pet
Natural Blue with Turmeric	3.6-6.5	Good	Poor	Good	●	●	●	●	●	●
Natural Blue with Beta Carotene	3.6-8.0	Good	Good	Good	●	●	●	●	●	●
Spirulina with Turmeric	5.0-6.5	Fair	Poor	Poor	●	●	●	●	●	
Spirulina with Beta Carotene	5.0-8.0	Fair	Good	Poor	●	●	●	●	●	
Copper-chlorophyllin	3.0-7.0	Poor	Good	Good						●
Anthocyanin with Turmeric	6.0-8.0	Good	Good	N/A					●	●
Anthocyanin with Beta Carotene	6.0-8.0	Good	Good	N/A					●	●

NATURAL BLUE

Color is a powerful form of communication and is irreplaceable. Knowing the power of color psychology is an advantage and it can help create the most appealing color combinations for a food product.

Blue has a calming effect and can relax the nervous system. When used together with warm colors like yellow or red, blue can create high-impact, vibrant designs.



Options

- Three unique natural blue sources are available
 - Sensient's Natural Blue vegetable juice
 - Spirulina
 - pH-stabilized vegetable or fruit juice blue
- pH 3.6-7.0 stable
- Natural blue can be used as the basis for additional natural colors including, green, purple and brown
- Reduced flavor and olfactory impact
- Oil-dispersible and water-dispersible forms available

Regulatory

- Sensient's Natural Blue color is labeled "vegetable juice (color)" for finished products under FDA Regulation 21 CFR Section 73.260
- Foods – 21 CFR 73.530 – Spirulina Extract may be safely used for coloring confections (including candy and chewing gum), frostings, ice cream and frozen desserts, dessert coatings and toppings, beverage mixes and powders, yogurts, custards, puddings, cottage cheese, gelatin, breadcrumbs and ready-to-eat cereals (excluding extruded cereals)

SOURCES	STABILITY			PRIMARY APPLICATION						
	pH	Heat	Light	Acid-stable	Beverage	Dairy	Baking	Processed Food	Confection	Pet
Natural Blue Vegetable Juice	3.6-7.0	Good	Good	Good	●	●	●	●	●	●
Spirulina	5.0-8.0	Good	Good	Poor		●	●	●	●	
pH Adjusted Natural Blue	4.0-8.0	Good	Good	N/A			●	●	●	●

NATURAL PURPLE

Color is the first property we notice when we recognize and categorize food.

This is why the appearance of food and beverages is so important for consumers choosing their favorite product.

Purple combines the stability of blue and the energy from red. It is associated with power, respect, wealth and magic. According to studies, almost 75 percent of children prefer purple to all other colors.



Options

- Purple vegetable juices are available that can withstand the presence of high temperatures and lessen the color degradation process
- Azo-free
- Low-calorie
- Reduced flavor and olfactory impact
- Oil-dispersible and water-dispersible forms available

Regulatory

- Foods – 21 CFR 73.170 – Grape skin extract as a color additive in the U.S. is restricted to use in beverages
- Foods – 21 CFR 73.169 – Grape color extract as a color additive in the U.S. is restricted to non-beverage uses
- Sensient's Natural Blue color is labeled "vegetable juice (color)" for finished products under FDA Regulation 21 CFR Section 73.260
- Foods – 21 CFR 73.530 – Spirulina Extract may be safely used for coloring confections (including candy and chewing gum), frostings, ice cream and frozen desserts, dessert coatings and toppings, beverage mixes and powders, yogurts, custards, puddings, cottage cheese, gelatin, breadcrumbs and ready-to-eat cereals (excluding extruded cereals)

SOURCES	STABILITY				PRIMARY APPLICATION					
	pH	Heat	Light	Acid-stable	Beverage	Dairy	Baking	Processed Food	Confection	Pet
Vegetable Juices	4.0-7.0	Fair	Good	Poor			●	●	●	●
Vegetable Juice	2.5-3.8	Good	Good	Good	●				●	●
Vegetable Juice and Spirulina	5.0-8.0	Fair	Good	Poor	●	●	●	●	●	
Vegetable Juices	3.8-6.0	Good	Good	Good	●	●				
Carmine and Spirulina	5.0-8.0	Good	Good	Poor	●	●	●	●	●	
Carmine and Vegetable Juice	3.5-7.0	Good	Good	Good	●	●	●	●	●	●

NATURAL BROWN

Brown ranges from yellow and red nuances to almost black shades, typically described as caramel, bronze, burnt sienna and sepia. Such shades are associated with certain taste profiles. Brown conveys a feeling of warmth, honesty and wholesomeness. Although found in nature year-round, brown is often considered a fall and winter color.



Options

- Natural alternatives to synthetic colors
- Caramel or cocoa color replacements
- 4-Mel free and low 4-Mel
- Reduced flavor and olfactory impact
- Oil-dispersible and water-dispersible forms available

Regulatory

- Sensient caramel colors have the average level of 4-Mel listed on their specifications
- Caramel colors can also have sulfites, and sulfite levels are listed on the specifications
- Foods – 21 CFR 73.200 – Synthetic iron oxide can be safely used for the coloring of sausage casings intended for human consumption in an amount not exceeding 0.10 percent by weight of the finished food
- Foods – 21 CFR 73.200 – Synthetic iron oxide may be safely used for the coloring of dog and cat foods in an amount not exceeding 0.25 percent by weight of the finished food

SOURCES	STABILITY				PRIMARY APPLICATION					
	pH	Heat	Light	Acid-stable	Beverage	Dairy	Baking	Processed Food	Confection	Pet
Caramel	2.5-8.0	Good	Good	Good	●	●	●	●	●	●
Carotenoid and Vegetable Juice	3.6-4.2	Good	Good	Good	●	●		●	●	●
Carotenoid and Vegetable Juice	4.0-8.0	Fair	Good	Good			●	●	●	●
Iron Oxide	2.0-8.0	Excellent	Excellent	Excellent						●

NATURAL WHITE & BLACK

White imparts a clean, cool and refreshing feeling. It is associated with purity, goodness and innocence. White is often associated with dairy and low-calorie foods.

Considered a reliable, elegant and mysterious color, a black or gray background can be used to make other colors stand out.

WHITE

Options

- Low-dust options: Titanium Dioxide dispersions
- Titanium Dioxide replacement (Avalanche™)
- No flavor impact
- Oil-dispersible and water-dispersible forms available

Regulatory

- Foods – 21 CFR 73.575 – Titanium Dioxide is restricted to 1% by weight in the finished food

SOURCES	STABILITY				PRIMARY APPLICATION					
	pH	Heat	Light	Acid-stable	Beverage	Dairy	Baking	Processed Food	Confection	Pet
Titanium Dioxide	2.0-8.0	Excellent	Excellent	Excellent	●	●	●	●	●	●
Avalanche™	4.0-8.0	Good	Good	N/A				●	●	●

Options

- Reduced flavor and olfactory impact
- Caramel-free
- Azo-free
- Oil-dispersible and water-dispersible forms available
- Clear and opaque
- Light-stable

Regulatory

- Foods – 21 CFR 73.200 – Synthetic iron oxide can be safely used for the coloring of sausage casings intended for human consumption in an amount not exceeding 0.10 percent by weight of the finished food
- Foods – 21 CFR 73.200 – Synthetic iron oxide may be safely used for coloring of dog and cat foods in an amount not exceeding 0.25 percent by weight of the finished food
- Sensient Caramel colors have the average level of 4-Mel listed on their specifications
- Caramel colors can also have sulfites, and sulfite levels are listed on the specifications

BLACK

SOURCES	STABILITY				PRIMARY APPLICATION					
	pH	Heat	Light	Acid-stable	Beverage	Dairy	Baking	Processed Food	Confection	Pet
Caramel	2.5-8.0	Good	Good	Good				●	●	
Vegetable Juice and Caramel Blends	4.0-8.0	Fair	Good	Poor	●	●	●	●	●	
Vegetable and Fruit Juice Blends	3.6-8.0	Fair	Good	Good			●	●	●	●
Iron Oxide	2.0-8.0	Excellent	Excellent	Excellent						●
Vegetable Juice, Turmeric, Spirulina	5.0-8.0	Good	Good	Poor		●	●	●	●	
Vegetable Juice, Carotenoid, Spirulina	5.0-8.0	Good	Good	Poor	●	●	●	●	●	
Vegetable Juice, Caramel, Spirulina	5.0-8.0	Fair	Good	Poor	●	●	●	●	●	



Sensient has been delivering premium sensory appeal and product performance to the world's leading brands for over 100 years.

As consumer demand increases for simple, more wholesome ingredients, and studies reveal some of the health benefits of natural colors, Sensient works to develop natural color innovations that help define and advance the natural color industry.

Sensient's color formulations combine creativity and unsurpassed technical expertise to help you find the right color solution for your needs. [Let Sensient create your unique natural color today.](#)





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Define and protect your brand

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