

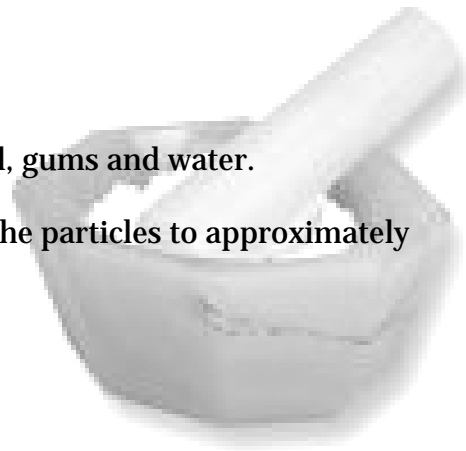
Powder Flavors (P.F.)

The first powdered or dry flavors were made with Sorbitol. In the process, the Sorbitol was melted, the flavor was mixed in, the mixture was spread out and dried, and then ground into pieces – the dry flavor was born. The oils, however, were on the outside of the powder, not encapsulated.

Today's dry flavors are "spray dried", a method started in 1950/55. In this method the oils are encapsulated, which reduces oxidation, evaporation and rancidity of the oils.

Manufacturing Process:

1. First, an emulsion is made: This consists of oil, gums and water.
2. The emulsion is homogenized to break down the particles to approximately one micron in size.
3. The emulsion is spray dried.



Spray Drying:

1. The emulsion is pumped into the atomizer head. The atomizer head contains a "spinning wheel".

2. The emulsion hits the wheel and is spun out into a heated chamber, which has a temperature between 175 - 200° C.
3. The water evaporates off.
4. The gums come back to a solid state and “locks in”, or encapsulates the oil.
5. The solids become heavier, fall into a cyclone and are collected.

The ideal form of a dry flavor is that the entire flavor is locked in a coating, which protects the flavor. However, not all the oil is completely locked in.

Advantages of Spray Dried Powders:

- A. Dry flavors increase the shelf life of citrus oils because the oil is locked in and does not get rancid through oxidation.
- B. Dry flavors are easier to handle in dry application than liquid flavors.
Some applications of dry flavors are cake mixes, pudding powder, instant foods, beverage powders, high temperature products, etc.
- C. Dry flavors are better for products that are baked, as they are more heat resistant than their liquid counterparts.



Powder Flavors (P.F.)

Natural **Almond** Type Flavor PF #2964

Usage: 0.25% in finished beverage

Natural **Burnt Almond** Type Flavor PF #4191

Usage: 0.75% in finished beverage

Artificial **Amaretto** Flavor P.F. #2695

Usage: 0.05% in finished beverage

Natural **Apple** Type Flavor PF #6087

Usage: 0.03% in finished beverage

Natural & Artificial **Apple** Flavor P.F. #2194

Usage: 0.05% in finished beverage

Natural & Artificial **Sour Green Apple** Flavor P.F. #3760

Usage: 0.01% in finished beverage

Natural & Artificial **Apricot** Flavor P.F. #4140

Usage: 0.3% in baked goods

Artificial **Asparagus** Flavor P.F. #8477

Usage: 0.12% in soup

Natural & Artificial **Bacon** Flavor P.F. #5449

Usage: 0.025% in finished product

Natural **Banana** Type Flavor PF #2685

Usage: 0.015% in finished beverage

Natural & Artificial **Banana** Flavor P.F. #4258

Usage: 0.0125% in finished beverage

Natural **Banana Nut** Type Flavor P.F. #8602

Usage: 0.75% in baked goods

Natural **Sweet Basil** Flavor P.F. #2811

Usage: 0.02% in finished product

Natural & Artificial **Berry** Flavor P.F. #2687

Usage: 0.01% in finished beverage

Natural **Blueberry** Flavor WONF PF #7971

Usage: 0.02% in finished beverage

0.8% in baked goods

Natural & Artificial **Bubblegum** Flavor P.F. #6897
Usage: 0.02% in finished beverage
(*Bazooka type*)

Natural & Artificial **Bubblegum** Flavor P.F. #7302
Usage: 0.01% in finished beverage
(*Juicyfruit type*)

Natural **Butter** Type Flavor PF #2971
Usage: 0.02-0.05% in finished beverage

Natural & Artificial **Sweet Butter** Flavor P.F. #3129
Usage: 0.01% in finished beverage
0.25% in baked goods

Natural & Artificial **Butter Rum** Flavor P.F. #3184
Usage: 0.05% in finished beverage

Natural & Artificial **Butterscotch** Flavor P.F. #3206
Usage: 0.02% in finished beverage

Natural & Artificial **Cappuccino** Flavor P.F. #2860
Usage: 0.01% in finished beverage
(*Toffee type*)

Natural & Artificial **Cappuccino** Flavor P.F. #2862
Usage: 0.01% in finished beverage
(*Spicy type*)

Natural **Caramel** Type Flavor PF #7688
Usage: 0.01% in finished beverage

Natural **Caramel** Type Flavor P.F. #8069
Usage: 0.75% in baked goods

Natural & Artificial **Caramel** Flavor P.F. #3142
Usage: 0.02% in finished beverage

Natural **Carrot** Flavor P.F. #8604
Usage: 0.3-0.5% in baked goods

Natural **Parmesan Cheese** Type Flavor P.F. #6491
Usage: 0.1% in finished product

Artificial **Sharp Cheddar Cheese** Flavor P.F. #6488
Usage: 0.2% in finished product

Natural & Artificial **Romano Cheese** Flavor P.F. #6493
Usage: 0.1% in finished product

Natural **Cherry** Type Flavor PF #4757
Usage: 0.05% in finished beverage

Natural & Artificial **Cherry** Flavor P.F. #2197
Usage: 0.05% in finished beverage

Natural **Black Cherry** Type Flavor PF #4356
Usage: 0.02% in finished beverage

Natural & Artificial **Black Cherry** Flavor P.F. #4947
Usage: 0.02% in finished beverage

Natural **Chocolate** Flavor WONF PF #4149
Usage: 0.5% in finished beverage

Artificial **Chocolate** Flavor P.F. #2563
Usage: 0.01% in finished beverage

Natural & Artificial **Milk Chocolate** Flavor P.F. #2782
Usage: 0.04% in finished beverage

Natural & Artificial **Chocolate Fudge** Flavor P.F. #4131
Usage: 0.01% in finished beverage

Natural **Cinnamon** Type Flavor PF #6110
Usage: 0.01% in finished beverage

Natural & Artificial **Cinnamon** Flavor P.F. #2680
Usage: 0.01% in finished beverage

Cloudifier P.F. #4515
Usage: 0.1% in finished beverage

Natural **Coconut** Type Flavor PF #2671
Usage: 0.025% in finished beverage

Natural & Artificial **Coconut** Flavor P.F. #2675
Usage: 0.01% in finished beverage

Natural **Toasted Coconut** Type Flavor PF #2673
Usage: 0.025% in finished beverage

Natural **Cola** Type Flavor PF #2506
Usage: 0.03% in finished beverage

Natural & Artificial **Cola** Flavor P.F. #8271
Usage: 0.02% in finished beverage
(*Coca-Cola type*)

Natural **Coffee** Flavor PF #6173
Usage: 0.04% in finished beverage

Natural & Artificial **Corn** Flavor P.F. #6278
Usage: 0.03% in soup

Natural **Cranberry** Type Flavor PF #6313
Usage: 0.2% in finished beverage

Natural **Cream** Type Flavor PF #4471
Usage: 0.02% in finished beverage

Natural & Artificial **Cream** Flavor P.F. #2797
Usage: 0.01% in finished beverage
(*Vanilla type*)

Natural & Artificial **Cream** Flavor P.F. #3085
Usage: 0.05% in finished beverage

Artificial **Sour Cream** Flavor P.F. #7545
Usage: 0.02% in finished beverage

Artificial **Cream Cheese** Flavor P.F. #5838
Usage: 0.05% in finished beverage

Artificial **Cream Soda** Flavor P.F. #3643
Usage: 0.01% in finished beverage
0.1% in baked goods

Natural **Crème Brulee** Type Flavor PF #4608
Usage: 0.1% in finished beverage

Artificial **Crème Brulee** Flavor P.F. #6480
Usage: 0.02% in finished beverage

Artificial **Cucumber** Flavor P.F. #4061

Usage: 1.0% in salad dressing

Natural **Dairy** Type Flavor PF #2681

Usage: 0.01% in finished beverage

Natural & Artificial **Dulce de Leche** Type Flavor P.F. #6696

Usage: 0.03% in finished beverage

A popular dessert flavor that is rich, creamy and milky, with caramel nuances

Natural & Artificial **Ginseng** Flavor P.F. #2602

Usage: 0.02% in finished beverage

Artificial **Graham Cracker** Flavor P.F. #6481

Usage: 0.02% in finished beverage

Natural **Grape** Type Flavor PF #4338

Usage: 0.05% in finished beverage

Natural & Artificial **Grape** Flavor P.F. #3256

Usage: 0.015% in finished beverage

Natural **Grapefruit** Flavor WONF PF #2752

Usage: 0.02% in finished beverage

Natural & Artificial **Grapefruit** Flavor P.F. #2748

Usage: 0.02% in finished beverage

Artificial **Guanabana** Flavor P.F. #2853

Usage: 0.05% in finished beverage

Fruity, floral flavor with sour citrus notes and creamy nuances

Natural & Artificial **Ham** Flavor P.F. #4406

Usage: 0.05-0.06% in finished sauce

Natural **Country Ham** Type Flavor P.F. #4466

Usage: 0.05-0.06% in finished sauce

Natural & Artificial **Hazelnut** Flavor P.F. #2750

Usage: 0.02% in finished beverage

Natural **Hickory Smoke** Type Flavor P.F. #4068

Usage: 0.05-0.06% in finished sauce

Artificial **Honey** Flavor P.F. #6486

Usage: 0.02% in finished beverage

Natural & Artificial **Honey Butter** Flavor P.F. #8311
Usage: 0.25% in baked goods

Natural **Huckleberry** Type Flavor PF #8153
Usage: 0.015% in finished beverage

Artificial **Jalapeno** Flavor P.F. #6074
Usage: 0.05-0.06% in finished sauce

Natural & Artificial **Ketchup** Flavor P.F. #5453
Usage: 0.2% in tomato sauce

Natural **Kiwi** Type Flavor PF #4781
Usage: 0.02% in finished beverage

Natural **Kiwi** Type Flavor P.F. #7998
Usage: 0.5% in baked goods

Natural & Artificial **Kiwi** Flavor P.F. #2893
Usage: 0.03% in finished beverage

Natural **Lemon** Flavor PF #2741
Usage: 0.2% in finished beverage

Natural & Artificial **Lemon** Flavor P.F. #2568
Usage: 0.02% in finished beverage
0.25% in baked goods

Natural **Lemon Juice** Flavor PF #4089
Usage: 0.03% in finished beverage

Natural & Artificial **Lemon-Lime** Flavor P.F. #2569
Usage: 0.02% in finished beverage

Natural **Lime** Flavor PF #2538
Usage: 0.02% in finished beverage

Natural & Artificial **Lime** Flavor P.F. #2567
Usage: 0.02% in finished beverage

Natural **Malted Milk** Type Flavor PF #3740
Usage: 0.02% in finished beverage

Artificial **Malted Milk** Flavor P.F. #2574
Usage: 0.02% in finished beverage

Natural **Mandarin Orange** Flavor PF #5563
Usage: 0.01% in finished beverage

Natural **Mango** Type Flavor PF #7853
Usage: 0.5-0.75% in finished beverage

Natural **Mango** Type Flavor P.F. #7996
Usage: 1.0% in baked goods

Natural & Artificial **Mango** Flavor P.F. #4078
Usage: 0.01% in finished beverage
Tropical, fruity, fatty flavor with citrus notes

Natural **Mango Peach** Type Flavor PF #6585
Usage: 0.05% in finished beverage

Natural **Mangosteen** Type Flavor P.F. #8679
Usage: 0.2% in finished beverage

Natural **Maple** Type Flavor PF #6501
Usage: 0.2% in finished beverage

Natural **Maple** Flavor WONF PF #6946
Usage: 0.02-0.05% in finished beverage

Natural & Artificial **Maple** Flavor P.F. #3088
Usage: 0.04% in finished beverage

Natural **Marshmallow** Type Flavor P.F. #7788
Usage: 1.0% in baked goods

Natural **Masking Agent** Type Flavor PF #4992
Usage: 0.05% in protein base
(*Vanilla type*)
Covers gritty “beanie” aftertaste of soy protein products

Natural **Masking Agent** Type Flavor PF #6214
Usage: 0.04% in sauce gravy
(*Smokey Hamburger type*)
For animal protein products

Natural & Artificial **Masking Agent** Flavor P.F. #4720
Usage: 0.05% in protein base
(*Vanilla type*)
Covers gritty “beanie” aftertaste of soy protein products

Natural **Protein Masking Agent** Type Flavor PF #7838
Usage: 0.2% in soy milk
0.6-0.8% in whey beverages

Natural **Soy Masking Agent** Type Flavor PF #8236
Usage: 0.04% in soy milk
Adds milk type character to soy based milk type drinks

Artificial **Soy Masking Agent** Flavor P.F. #6113
Usage: 0.02% in finished beverage
Covers gritty “beanie” aftertaste of soy protein products

Natural & Artificial **Melon** Flavor P.F. #4088
Usage: 0.01% in finished beverage

Natural **Mesquite Smoke** Type Flavor P.F. #2810
Usage: 0.04% in finished product

Natural **Milk** Type Flavor PF #8145
Usage: 0.04% in soy milk
Adds milk flavor to soy products

Natural **Mocha Coffee** Type Flavor PF #6172
Usage: 0.5% in finished beverage

Natural & Artificial **Mushroom** Flavor P.F. #4107
Usage: 0.05% in soup

Natural **Orange** Flavor PF #2711
Usage: 0.05% in finished beverage
0.5% in baked goods

Natural & Artificial **Orange Juice** Flavor P.F. #2572
Usage: 0.02% in finished beverage

Natural & Artificial **Papaya** Flavor P.F. #4212
Usage: 0.01% in finished beverage

Natural & Artificial **Papaya** Flavor P.F. #5286
Usage: 0.01% in finished beverage
Very sweet, juicy flavor reminiscent of pineapple and peach

Natural & Artificial **Passion Fruit** Flavor P.F. #7857
Usage: 0.25-0.5% in finished beverage
Floral, juicy, fruity flavor with a slight astringency

Natural **Paw Paw** Type Flavor P.F. #8575
Usage: 0.04% in finished beverage

Natural **Peach** Type Flavor PF #2531
Usage: 0.1% in finished beverage

Artificial **Peach** Flavor P.F. #2535
Usage: 0.06% in finished beverage

Natural **Peanut Butter** Flavor WONF #4164
Usage: 0.5% in finished beverage

Natural & Artificial **Peanut Butter** Flavor P.F. #4077
Usage: 0.02-0.05% in finished beverage

Natural **Peppermint** Flavor WONF PF #4093
Usage: 0.02-0.05% in finished beverage
0.2% in baked goods

Natural & Artificial **Pina Colada** Flavor P.F. #4721
Usage: 0.1% in finished beverage
A refreshing blend of pineapple and coconut flavors with a creamy background

Natural **Pineapple** Type Flavor PF #2740
Usage: 0.3% in finished beverage

Natural **Pineapple** Type Flavor P.F. #8005
Usage: 0.1% in baked goods

Natural & Artificial **Pineapple** Flavor P.F. #2191
Usage: 0.02% in finished beverage

Natural **Pizza Spice** Type Flavor P.F. #4219
Usage: 0.05-0.06% in finished sauce

Natural **Pomegranate** Type Flavor PF #8038
Usage: 0.01% in finished beverage

Natural & Artificial **Pomegranate** Flavor P.F. #7650
Usage: 0.01% in finished beverage

Artificial **Popcorn** Flavor P.F. #3754
Usage: 0.05% in finished beverage

Natural & Artificial **Potato** Flavor P.F. #3276
Usage: 0.2% in soup

Artificial **Mashed Potato** Flavor P.F. #5253
Usage: 0.01% in finished beverage

Natural **Pumpkin Spice** Type Flavor PF #6536
Usage: 0.04% in finished beverage

Natural & Artificial **Punch** Flavor P.F. #2688
Usage: 0.01% in finished beverage

Natural & Artificial **Ranch Dressing** Flavor P.F. #7837
Usage: 1.5-2.0% in salad dressing

Natural **Raspberry** Type Flavor PF #2940
Usage: 0.12% in finished beverage

Natural **Raspberry** Type Flavor P.F. #7621
Usage: 0.4% in baked goods

Artificial **Raspberry** Flavor P.F. #2555
Usage: 0.02% in finished beverage

Natural **Rocky Road** Type Flavor P.F. #7789
Usage: 0.2% in baked goods

Artificial **Root Beer** Flavor P.F. #3300
Usage: 0.03% in finished beverage

Natural **Sausage** Type Flavor P.F. #4092
Usage: 0.05-0.06% in finished sauce

Natural & Artificial **Soy Sauce** Flavor P.F. #4195
Usage: 0.05-0.06% in finished sauce

Natural & Artificial **Spaghetti** Flavor P.F. #4188
Usage: 0.05-0.06% in finished sauce

Natural **Spearmint** Flavor PF #2769
Usage: 0.01% in finished beverage

Natural & Artificial **Spearmint** Flavor P.F. #2770
Usage: 0.02-0.05% in finished beverage

Natural **Strawberry** Type Flavor PF #3769
Usage: 0.7% in finished beverage

Natural & Artificial **Strawberry** Flavor P.F. #2196
Usage: 0.025% in finished beverage

Natural & Artificial **Jammy Strawberry** Flavor P.F. #3103
Usage: 0.03% in finished beverage

Natural & Artificial **Strawberry Kiwi** Flavor P.F. #4987
Usage: 0.01% in finished beverage

Natural **Sugar** Type Flavor PF #5284
Usage: 0.1% in finished beverage

Natural **Tangerine** Flavor WONF PF #5973
Usage: 0.02-0.05% in finished beverage

Natural & Artificial **Black Tea** Flavor P.F. #3874
Usage: 0.1% in finished beverage

Natural **Chai Tea** Type Flavor PF #4651
Usage: 0.02-0.05% in finished beverage

Natural **Earl Grey Tea** Type Flavor PF #4786
Usage: 0.05% in finished beverage

Natural **Green Tea** Type Flavor PF #8093
Usage: 0.1% in finished beverage

Natural & Artificial **Tequila** Flavor P.F. #6956
Usage: 0.2% in finished beverage
Characteristic smooth, spicy flavor, reminiscent of agave

Natural & Artificial **Teriyaki Sauce** Flavor P.F. #8275
Usage: 0.05-0.06% in finished sauce

Natural **English Toffee** Type Flavor PF #2763
Usage: 0.01% in finished beverage

Natural **English Toffee** Flavor P.F. #8057
Usage: 1.0% in baked goods

Natural & Artificial **English Toffee** Flavor P.F. #2765
Usage: 0.01% in finished beverage

Natural & Artificial **Tomato** Flavor P.F. #4108
Usage: 0.01% in soup

Natural & Artificial **Fried Green Tomato** Flavor P.F. #5545
Usage: 0.01% in finished product

Natural **Tropical Fruit** Type Flavor PF #2745
Usage: 0.1% in finished beverage

Natural & Artificial **Tutti Frutti** Flavor P.F. #3285
Usage: 0.01% in finished beverage

Natural **Vanilla** Type Flavor PF #6564
Usage: 0.02-0.05% in finished beverage

Artificial **Vanilla** Flavor P.F. #2519
Usage: 0.05% in finished beverage

Artificial **Vanilla Custard** Flavor P.F. #2562
Usage: 0.01% in finished beverage

Natural & Artificial **Vanilla Hazelnut** Flavor P.F. #4129
Usage: 0.01% in finished beverage

Natural & Artificial **Vanilla Marshmallow** Flavor P.F. #4268
Usage: 0.01% in finished beverage

Natural **French Vanilla** Type Flavor PF #4054
Usage: 0.02% in finished beverage
1.0% in baked goods

Natural **French Vanilla** Type Flavor PF #7401
Usage: 0.02% in finished beverage
(*Dairy free*)

Natural & Artificial **French Vanilla** Flavor P.F. #2712
Usage: 0.01% in finished beverage

Natural **White Vinegar** Type Flavor P.F. #6495
Usage: 0.2-0.5% in finished product

Natural **Black Walnut** Flavor WONF PF #7311
Usage: 0.2% in finished beverage

Natural & Artificial **Black Walnut** Flavor P.F. #3950
Usage: 0.02-0.05% in finished beverage

Natural & Artificial **Watermelon** Flavor P.F. #6726
Usage: 0.04% in finished beverage

Natural **Bourbon Whiskey** Type Flavor P.F. #8511

Usage: 1.0 – 2.0% in spice blends

1.0% in baked goods

Natural **Wildberry** Type Flavor PF #7465

Usage: 0.01% in finished beverage

Natural **Wintergreen** Type Flavor PF #3294

Usage: 0.05% in finished beverage