

Where Might You Encounter Phosphates Today?

Food and Beverages

Finished Product	Ingredient	Phosphate Function
Baked Goods		
Baking Powder Self-rising Flour	Sodium Acid Pyrophosphate, Monocalcium Phosphate	Acid-Base reaction with sodium bicarbonate to produce carbon dioxide (CO ₂)
Cakes Baking Mixes (Waffles, Pancake, Muffin)	Sodium Acid Pyrophosphate, Monocalcium Phosphate, Sodium Aluminum Phosphate (Acidic)	Moderate action leavening; double action leavening
Cake Donuts Batter And Breadding	Sodium Acid Pyrophosphate	Fast action Leavening
Refrigerated Dough Frozen dough/batters	Sodium Acid Pyrophosphate , Sodium Aluminum Phosphate (Acidic)	Heat activated leavening
Reduced Sodium Baking	Monocalcium Phosphate, Dicalcium Phosphate, Calcium Acid Pyrophosphate	Acid-Base reaction with bicarbonate to produce CO ₂ , Calcium enrichment.
Beverages		
Colas	Phosphoric Acid	Acidulant
Chocolate Milk	Tetrasodium Pyrophosphate	Suspend cocoa
Dry Mixes	Tricalcium Phosphate	Prevent caking; clouding agent
Buttermilk	Tetrasodium Pyrophosphate, Disodium Phosphate	Maintain protein dispersion
Fruit Juices	Tricalcium Phosphate	Calcium and Phosphorus fortification
Sports Drinks	Monopotassium Phosphate, Monosodium Phosphate	Provide electrolytes (Na, K); pH buffering
Canned Milk, UHT Milk	Disodium Phosphate. Dipotassium Phosphate, Sodium Hexametaphosphate	Protein Stabilization
Soy Beverages	Tricalcium Phosphate	Calcium and Phosphorus fortification
Strawberry Flavor Milk	Tetrasodium Pyrohosphate Sodium Acid Pyrophosphate	Bind iron to maintain pink color
Cereals		
Cooked Cereals	Disodium Phosphate, Tricalcium Phosphate	Decrease cooking time; Calcium and Phosphorus fortification
Extruded. Dry	Disodium Phosphate. Trisodium Phosphate.	Aid in the flow through

Cereals	Tricalcium Phosphate	extruder; Cereal color modification; calcium and phosphorus fortification
Dairy Products		
Cottage Cheese	Phosphoric Acid	Direct set by acidification
Cheese Dips and Sauces	Disodium Phosphate, Trisodium Phosphate, Sodium Hexametaphosphate	Emulsifying Action
Cheese Slices	Disodium Phosphate, Trisodium Phosphate, Tetrasodium Pyrophosphate	Emulsifying Action
Cheese Powders	Dipotassium Phosphate, Sodium Tripolyphosphate, Sodium Hexametaphosphate	Protein Stabilization
Grated Cheese	Tricalcium Phosphate	Flow Aid
Cheese Starter Cultures	Disodium Phosphate, Dipotassium Phosphate	Inhibit Bacteriophage
Whey Processing	Sodium Hexametaphosphate	Calcium complexation
Imitation Cheese	Disodium Phosphate, Trisodium Phosphate, Sodium Hexametaphosphate	Emulsifying Action
Non-dairy creamer	Dipotassium Phosphate	Buffer for smooth mixing into coffee
Whipped topping	Sodium Hexametaphosphate, Tetrasodium Pyrophosphate	Improve dairy protein foaming property
Instant Puddings, No-bake cheesecakes	Monocalcium Phosphate, Disodium Phosphate, Tetrasodium Pyrophosphate	Protein coagulant
Ice Cream (Hard, soft, imitation), Frozen dessert	Disodium Phosphate, Tetrasodium Pyrophosphate, Sodium Hexametaphosphate	Protein stabilization, prevent churning
Reduced Sodium Dairy	Dipotassium Phosphate, Tripotassium Phosphate, Tetrapotassium Pyrophosphate, Potassium Tripolyphosphate	Same function as Sodium salts, Potassium enrichment
Egg Products		
Whole Egg	Monosodium Phosphate, Monopotassium Phosphate	Color stability
Egg Yolk	Tetrasodium Pyrophosphate	Inhibit rancidity
Egg whites	Sodium Hexametaphosphate, Tetrasodium Pyrophosphate	Improve whipping, foam stability
Fruit and Vegetables		
Canned Fruits	Monocalcium Phosphate	Maintain firmness
Vegetables (frozen or canned)	Monocalcium Phosphate, Sodium Tripolyphosphate, Sodium	Texture modification (increase firmness or

	Hexametaphosphate	tenderness)
Peanuts	Sodium Hexametaphosphate, Sodium Tripolyphosphate	Soften shell
Meat Products		
Ham, corned beef	Sodium Tripolyphosphate, Sodium Tripolyphosphate/Sodium Hexametaphosphate Blends	Maintain meat juiciness and shelf life
Sausage, franks, bologna	Sodium Tripolyphosphate, Tetrasodium Pyrophosphate, Sodium Acid Pyrophosphate	Emulsion Stabilization, Cure color development
Roast beef	Sodium Tripolyphosphate, Sodium Hexametaphosphate	Maintain meat juiciness and shelf life
Reduced Sodium Meat	Potassium Tripolyphosphate , Tetrapotassium Pyrophosphate	Maintain meat juiciness and shelf life
Pasta and Noodles		
Pasta products	Disodium Phosphate	Decrease cook time
Instant fried Noodles	Sodium Tripolyphosphate	Improve noodle mouth feel
Pet Food		
Cat Food	Phosphoric Acid	pH adjustment
Canned Food (for both canines and felines)	Sodium Acid Pyrophosphate, Sodium Tripolyphosphate, Tetrasodium Pyrophosphate	Solubilize protein to enhance flavor
Pet Treats	Sodium Hexametaphosphate, Tetrasodium Pyrophosphate	Tartar control
Potatoes		
French Fries, Mashed Potatoes, Hash browns, Potato flakes	Sodium Acid Pyrophosphate	Bind iron to inhibit iron induced blackening
Baked Potato Chips	Monocalcium Phosphate	Create surface bubbles
Poultry Products		
Poultry products	Sodium Tripolyphosphate; Sodium Tripolyphosphate/Sodium Hexametaphosphate Blends	Moisture binding
Restructured poultry Products, Poultry Sausage	Sodium Tripolyphosphate, Tetrasodium Pyrophosphate, Sodium Acid Pyrophosphate	Emulsion Stabilization
Reduced Sodium Poultry products	Potassium Tripolyphosphate , Tetrapotassium Pyrophosphate	Same function as Sodium salts, Potassium enrichment
Carcass wash	Trisodium Phosphate	Antibacterial
Seafood		

Shrimp (Frozen or Cooked)	Sodium Tripolyphosphate	Moisture retention, Deshelling aid
Scallop, Fish Fillets	Sodium Tripolyphosphate, Sodium Hexametaphosphate	Moisture retention and flavor
Canned Crab	Sodium Acid Pyrophosphate	Bind copper from blood to prevent discoloration
Canned Tuna	Sodium Acid Pyrophosphate	Adjust pH to prevent struvite formation (crystals that look like glass)
Surimi	Sodium Tripolyphosphate/Tetrasodium Pyrophosphate Blends	Cryoprotectant for protein
Reduced Sodium Sea foods	Potassium Tripolyphosphate , Tetrapotassium Pyrophosphate	Same function as Sodium salts

Pharmaceuticals & Personal Care Products

Finished Product	Ingredient	Phosphate Function
Vitamins and Mineral supplements	Tricalcium Phosphate, Dimagnesium Phosphate	Provide Calcium, Magnesium and Phosphorus
Prescription and Over the Counter (OTC) Tablets	Dicalcium Phosphate, Tricalcium phosphate	Inert ingredient to fill and bind tablets
Toothpaste	Dicalcium Phosphate Dihydrate, Dicalcium Phosphate Anhydrous	Polishing agent
Tartar Control Gels and Pastes	Tetrasodium Pyrophosphate, Sodium Acid Pyrophosphate, Sodium Tripolyphosphate, Sodium Hexametaphosphate	Tartar control
Ophthalmic	Mono- and Di- sodium phosphates, Mono and Di-potassium phosphates	Buffers to maintain a given pH
Tube Feedings	Monopotassium Phosphate, Mono- and Di-sodium phosphates	Potassium and/or Sodium replacing ingredient
Intravenous Fluids	Monopotassium Phosphate	Potassium replacing electrolyte
Mouthwash	Sodium Tripolyphosphate, Tetrasodium Pyrophosphate, Sodium Hexametaphosphate	Tartar control ingredients
Skin Care Cosmetics	Mono- and Di- sodium phosphates, Mono and Di-potassium phosphates	Buffers to maintain a given pH
Effervescent Tablets	Monocalcium Phosphate	Production of carbon dioxide (CO ₂) via acid-base reaction with sodium bicarbonate

Bath Crystals	Sodium Tripolyphosphate, Sodium Hexametaphosphate	Water softening agent
Cosmetics and Personal Care Products	Sodium Carbomer	Thickens, suspends, and stabilizes cosmetic formulations

Other Important Uses

Finished Product	Ingredient	Phosphate Function
Antifreeze	Dipotassium Phosphate	Resistant to temperature extremes and buffer to maintain alkaline pH
Asphalt Modification	Polyphosphoric Acid	Modifies paving grade asphalt to meet performance requirements
Automatic Dishwashing Detergent	Sodium Tripolyphosphate	Softens water, suspends soil and serves as an anti-spotting agent
Boiler Water	Sodium or Potassium Tripolyphosphate; Sodium Hexametaphosphate; Tetrasodium Pyrophosphate	Prevent the build up of scale in boilers; remove scale that may have accumulated
Car Wash Detergent	Sodium Tripolyphosphate	Softens water, removes soils and keeps soil from redepositing
Fire Extinguishers	Mono- and Di- ammonium Phosphates	Fire retardant
Flat Panel Displays	Phosphoric Acid	Etchant and cleaner
Heavy Duty Cleaners	Trisodium Phosphates, Tetra-Sodium and Potassium Pyrophosphates, Sodium Potassium Pyrophosphate	Remove oils and greases
Industrial and Institutional Cleaners	Sodium Tripolyphosphate, Tetrasodium Pyrophosphate	Softens water, dissolves fats and oils and keeps them from redepositing
Integrated Circuitry	Phosphoric Acid	Etchant and cleaner
Latex Paint	Sodium Potassium Tripolyphosphate, Potassium Tripolyphosphate	Dispersing Agent
Milk Scale Removal	Phosphoric Acid	Dissolves calcium

		based milk scale on dairy processing equipment
Organic Synthesis	Polyphosphoric Acid	Production of phosphate esters and catalysts in organic reactions; Synthesis of dyes
Paint and Wall Cleaner	Trisodium Phosphate, Dodecahydrate	Removes oil, grease and soils
Metal Cleaning	Phosphoric Acid, Monosodium Phosphate	Remove grease and coatings prior to painting
Metal Finishing (Anodizing)	Phosphoric Acid	Creates bright, shiny finish to metal
Water Softening	Sodium Hexametaphosphate Sodium Tripolyphosphate	Bind Calcium and Magnesium
Water Treatment	Phosphoric Acid Sodium Acid Pyrophosphate Tetrasodium Pyrophosphate	Form surface coating on pipes to prevent leaching of lead; sequester minerals as iron
Oil Drilling	Sodium Hexametaphosphate	Make drilling muds more flowable
Fertilizers	Monoammonium Phosphate; Diammonium Phosphate; Dipotassium Phosphate	Nutrients for plant growth
Citric Acid Fermentations	Dipotassium Phosphate	Growth factor
Cotton Processing	Tetrasodium Pyrophosphate	Bind iron and vanadium that hinder peroxide bleach
Synthetic Rubber	Tetrapotassium Pyrophosphate	Catalyst for butadiene and styrene
Styrofoam Production	Tricalcium Phosphate	Polymerization aid
Gypsum Wallboard	Sodium Trimetaphosphate	Firming of the composition board
Modified Starch	Sodium Tripolyphosphate; Sodium Trimetaphosphate	Produce starch mono- and di- esters in sealers and coatings
Paper Processing	Sodium Tripolyphosphate; Sodium Hexametaphosphate	Dispersants for coating loads, colorants and resins
Ceramics	Tricalcium Phosphate	Impart opalescent

Oven Proof Bakeware	Tricalcium Phosphate	Impart heat resistance
Photocopier Toner	Tricalcium Phosphate	Dispersing agent
Industrial Sodium Chloride	Tricalcium Phosphate	Anticaking agent
Refractory	Phosphoric Acid	Impart heat resistance for processing in the steel industry
Cement	Sodium Tripolyphosphate, Tetrasodium Pyrophosphate, Sodium Monofluorophosphate	Retard or delay the thickening of cement slurries especially when poured at great depths
Dyeing Wool	Diammonium Phosphate	Control of pH in dye bath to allow even penetration of dye through the wool