

# Food Grade Hose Selection Chart

Food category (According to MHW Notice No.370 of Food Sanitation Act in 1959)	Specific example of foods (Excerpt from "2015 Japanese Food Standard Composition List (7th revision)" issued by MEXT. Hereinafter referred to as the "Food Composition List")
<b>Oil, grease and fatty foods</b>  Foods with oil content in or on surface roughly over 20%, other than dried and solid foods  (Enforcement Announcement of 1973) EFC No. 541	(Some foods with "fat" items accounting for over 20% excerpted from the Food Composition List) • Oil and grease Vegetable oil (olive oil, sesame oil, palm oil, etc.), animal fat (beef fat and lard), butter, margarine and others (shortening), etc. • Meat Fat livestock meats (beef, pork, etc.), chicken skin, etc. • Milk products Cream (milk fat and vegetable fat, etc.) and cheese (partially), etc. • Seasonings and spices Chili oil, dressing (partially), mayonnaise and curry sauce, etc. • Seafood Tuna fat, canned tuna in oil, etc. • Beans Toasted soybean flour, etc. • Nuts and seeds Almond, peanut, walnut and sesame, etc. (paste) • Vegetables Groundnut, etc. • Confectionery Chocolate, etc. • Eggs Yolk, etc.
<b>Liquor</b>  Beverages containing alcohol content of over 1%  (Enforcement Announcement of 1973) EFC No. 541	(Some foods with alcohol content in "Remarks" accounting for over 1% excerpted from the Food Composition List) • Preference beverage Alcoholic beverage: Brewed beverages (refined sake, beer, sparkling liquor, wine, Chinese rice wine, etc.) Distilled spirits (shochu, whiskey, brandy, vodka, gin and rum, etc.) Cocktails (plum brandy, mixed refined sake, white sake, sweet sake, herbal sake, curacao etc.)
<b>Other foods</b>  Foods other than oil, grease, fatty foods and liquor	(Foods other than those in the above categories excerpted from the Food Composition List) • Grain Wheat, rice, buckwheat, corn, etc. • Potatoes and starch Potatoes (alimentary yam paste, sweet potato, potato, etc.), starch and starch products, etc. • Sugar and sweeteners Sugar (coarse sugar and processed sugar, etc.), starch sugar (glucose, etc.) and honey, etc. • Beans Azuki bean, kidney bean and soy bean (tofu products, fermented soy beans, soy milk, soy protein etc.) • Nuts and seeds Ginkgo nut and chestnut (Japanese chestnut and Chinese chestnut), etc. • Vegetables Radishes, ginger, tomatoes, garlic, spinach, artemisia, etc. • Fruit Strawberry, plum, citrus, watermelon, pear, banana, peach, apple, lemon, etc. • Mushrooms Cloud ear, shiitake mushroom, shimeji mushroom, maitake mushroom, matsutake mushroom, etc. • Alga Alga such as sea lettuce, green laver and water cloud, etc. • Seafood Horse mackerel, sardine, flatfish, porgy, shellfish, shrimp, crab, squid/octopus, etc. • Meat Ham and chicken (breast meat and ground meat), etc. • Eggs Albumen, steamed egg custard and omelet, etc. • Milk products Raw milk, normal milk, processed milk, defatted milk, milk beverage, yogurt and ice cream, etc. • Confectionery Japanese unbaked sweets, semiperishable sweets (sweet rice jelly and sponge cake, etc.) and chewing gum, etc. • Preference beverage Green tea, oolong tea, black tea, coffee and carbonated beverages, etc. • Seasonings and spices Worcester sauce, soy sauce, broth, dressing-like Japanese seasonings, etc.

## Regulations

Hose Product Name	TOYOFOODS	HYBRID TOYOFOODS	TOYORING-F Vacuum OK	TOYOFOODS-S Vacuum OK	HYBRID TOYOFOODS-N Vacuum OK	TOYOFUSSO	TOYOFUSSO-S Vacuum OK	TOYOFUSSO SOFT	ECORON	ECORON-S Vacuum OK	TOYOSILICONE	HYBRID TOYOSILICONE Vacuum OK	TOYOSILICONE-S Vacuum OK	TOYOSILICONE-S2 Vacuum OK	TOYOSILICONE-P Vacuum OK
FDA <sup>4</sup>	P.57	P.55	FDA <sup>4</sup>	FDA <sup>4</sup>	Vacuum OK	FDA <sup>3</sup>	FDA <sup>3</sup>	FDA <sup>3</sup>			FDA <sup>3</sup> USP <sup>5</sup>	FDA <sup>3</sup>	FDA <sup>3</sup> USP <sup>5</sup>	FDA <sup>3</sup>	FDA <sup>3</sup>
Materials	PVC					Tetrafluoro resin (modified ETFE) + polyurethane	Tetrafluoro resin (modified ETFE) + polyurethane	Tetrafluoro resin (modified ETFE) + PVC	Polyolefin resin + styrene series resin		Silicone rubber				
Type/size	Braided for pressure resistance 6~50φ	Tough and braided for pressure resistance 15~25φ	Rust-proof plastic coil 15~50φ	Tough spring 25~100φ	Tough and braided for pressure resistance 38~50φ	Braided for pressure resistance 9~50φ	Tough spring 15~38φ	Braided for pressure resistance 12~25φ	Braided for pressure resistance 6~50φ	Tough spring 25~50φ	Braided for pressure resistance 5~50φ	Tough plastic coil 12~38φ	Tough spring 19~50φ	Tough spring 19~50φ	Rust-proof plastic coil 12~25φ
Oil, grease and fatty foods	○	○	○	○	○	○	○	○	○	○	○ <sup>*1</sup>	○ <sup>*1</sup>	○ <sup>*1</sup>	○ <sup>*1</sup>	○ <sup>*1</sup>
Liquor	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Other foods	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Physical properties and specifications	Smell and flavors Note A	Note A	Note A	Note A	Note A	Note C	Note C	Note C	Note B	Note B	Note C	Note C	Note C	Note C	Note C
Heat resistant (°C)	70	70	70	70	50	80	80	70	60	60	150 <sup>7</sup>	130 <sup>7</sup>	150 <sup>7</sup>	150 <sup>7</sup>	100 <sup>7</sup>
Suck	Not allowed	Not allowed	Good (-0.1 MPa) <sup>6</sup>	Good (-0.1 MPa) <sup>6</sup>	Good (-0.1 MPa) <sup>6</sup>	Not allowed	Good (-0.1 MPa) <sup>6</sup>	Not allowed	Not allowed	Good (-0.1 MPa) <sup>6</sup>	Not allowed	Allowed (-0.05 MPa)	Good (-0.1 MPa) <sup>6</sup>	Good (-0.1 MPa) <sup>6</sup>	Allowed (-0.05 MPa)
Transparency	Good	Good	Good	Good	Normal	Good	Good	Good	Normal	Normal	Normal	Normal	Normal	Bad	Normal
Ease of handling	Ease of bending Good <sup>2</sup>	Good <sup>2</sup>	Good <sup>2</sup>	Good <sup>2</sup>	Good <sup>2</sup>	Bad	Bad	Good	Bad	Bad	Good	Good	Good	Good	Good
Disconnection and leakage	Good <sup>2</sup>	Good <sup>2</sup>	Good <sup>2</sup>	Good <sup>2</sup>	Good <sup>2</sup>	Good (dedicated couplings)	Good (dedicated couplings)	Good (dedicated couplings)	Relatively bad	Relatively bad	Normal	Normal	Normal	Normal	Normal
Cleaning and sterilization	Hypochlorous acid 200mg/L ○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Hot water (80°C 0.1MPa 30 minutes)	○	○	○	○	×	○	○	○	○	○	○	○	○	○	○

○ Working pressure varies depending on the hose size. For details, refer to the specification table in the catalog.  
 ※3 FDA (Food and Drug Administration) DMF Type II Registration No.25486  
 ※4 FDA (Food and Drug Administration) CFR 21.170 to 199 compliant product  
 ※5 USP (United States Pharmacopeia) USP Class VI Compatible  
 ※6 -0.1MPa is an approximate value.  
 ※7 Precautions vary according to use conditions such as fluid types and temperatures (steam, oil, high-temperature water, chemicals etc.). Before selection, please make sure to check "Precautions to ensure safe usage" on page 133.

○ These specific food examples are only excerpted with reference to values of target items in the Food Composition List and specialized processing such as composition extraction of raw materials and deviation across parts of foods are not considered.  
 ※ For details, refer to MEXT's 2015 Japanese Food Standard Composition List (7th revision) on the website. [http://www.mext.go.jp/a\\_menu/syokuhinseibun/1365297.htm](http://www.mext.go.jp/a_menu/syokuhinseibun/1365297.htm)

⚠ Important cautions (all hoses)  
 Smell and taste may be generated by reaction between the hose itself and the fluid (water, food and cleanser, etc.) (during or after use), so please thoroughly consider before making a final decision. (The laws are not applicable to milk products and they are not specially regulated. However, be sure to consider as indicated above before your final decision.) Refer to the following precautions.  
 Note A: Various smell and taste may be generated depending on fluid and temperature.  
 Note B: There are relatively less smell and taste, but resin-specific smell may be felt.  
 Note C: Although we cannot say there is no taste and smell, there is no problem for use.  
 ※ Our food grade hose series are also compliant with the Food Sanitation Act for milk and milk products.

⚠ Important cautions (TOYOSILICONE, HYBRID TOYOSILICONE, TOYOSILICONE-S, TOYOSILICONE-S2, TOYOSILICONE-P)  
 ※1 Dissolved object was below the criteria in the standard test in conformity to the Food Sanitation Act Notice No. 595. However, there are cautions for animal and vegetable oil:  
 (1) Penetration of the hose material may cause troubles due to the sticky surface such as 1) slippage, 2) lack of hygiene, 3) hose disconnection, etc.  
 (2) Never use the product at over 70°C. The hose material may become soft and easy to break and cause ruptures or cracks.

⚠ Transparency is slightly lost during use or cleaning of each hose, but most plastic materials have this tendency.  
 So there is no problem in terms of performance.

⚠ Important cautions (TOYOFOODS, HYBRID TOYOFOODS, TOYOFOODS-S, TOYORING-F, HYBRID TOYOFOODS-N)  
 ※2 If high concentration alcohol is used, hoses may be hardened more quickly. Dioxins may be emitted if incinerated at less than 800°C.

The TOYOX food grade hose series (TOYOSILICONE, HYBRID TOYOSILICONE, TOYOSILICONE-S, TOYOSILICONE-S2, TOYOSILICONE-P, ECORON, ECORON-S, TOYOFUSSO, TOYOFUSSO-S, TOYOFUSSO SOFT, TOYORING-F, HYBRID TOYOFOODS-N, TOYOFOODS, HYBRID TOYOFOODS, TOYOFOODS-S) can be used at plants producing refined sake, distilled spirits, tea, fermented drinks, cold beverages, coffee, soup, ice cream, candies, bread, noodles, canned goods, processed meats, vinegar, HP sauce, yogurt, seasonings, sesame oil, tofu, deli foods, kamaboko, pickles, wasabi, baby food, ketchup, mayonnaise, food flavorings, medicine, cosmetics, etc.