

Chemical Properties



In general, Panlite is stable in water, alcohol, oil, salts and weak acids, but adequate care should be taken as it becomes cloudy, swells or dissolves in alkali, aromatic hydrocarbons, halogenated hydrocarbons, etc.

Critical stress

Even when the stress acting on the plastic material is less than the allowable stress, it can cause crazing or cracking of the material when it is in contact with a chemical, though it depends on the kind of chemical. Such a phenomenon is called solvent cracking, and the minimum stress at which the solvent crack occurs is called the critical stress. Panlite can be left in contact with the chemicals whose critical stress values are over 13.7 MPa, but adequate care should be taken in cases where the critical stress values are less than 13.7 MPa (Table 6).

Table 6 Chemicals Resistance (Critical stress) of Panlite

Chemicals	23°C	70°C
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Inorganic chemicals

Hydrochloric acid 10%	○	×
Sulfuric acid 10%	○	○
Nitric acid 10%	○	×
Caustic soda 10%	△	×
Phosphoric acid 1%	○	×
Potassium chloride*	○	○
Sodium chloride*	○	○
Aluminum chloride*	○	×
Soda carbonate*	△	△
Soda sulfide*	×	×
Ammonium chloride*	×	×

Organic chemicals

Acetic acid 10%	○	
Acetic acid 100%	×	×
Formic acid 100%	△	
Methanol	△	×
Ethanol	○	△
Ethyl ether	×	×
Acetone	×	×
Ethyl acetate	×	×
Carbon tetrachloride	×	×
Benzene	×	×
Petroleum benzene	△	
Chloroform	×	×
Dichloroethane	×	×
Dioxane	×	×
Dimethylformamide	×	×
Tetrahydrofuran	×	×
Toluene	×	×
Phenol solvent 5%	×	×
Metacresol	×	×

* : 23°C saturated solution

Chemicals	23°C	70°C
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Oil products

Gasoline	×	×
Kerosene	○~△	×
Gas oil	○~△	×
Spindle oil 60 (Shell)	○	△
Open gear oil No. 1 (Daphne, Idemitsu)	○	△
Mechanic 56 (Daphne, Idemitsu)	○	○
Swalube RO-10 (Maruzen)	△	△
Swalube RO-100 (Maruzen)	○	○
Hydraulic L-150 (Kyodo oil)	○	○
Mobil Super 10W50 (Mobil)	○	○
Special-A Turbine oil (Maruzen)	○	○

Grease

Moricoat 44 grease M (Dow-Corning)	○	○
Silicone KS64 grease (Shin-Etsu)	○	○
Silicone YG3058 (Toshiba)	○	○
Showa Cup Class-1 No. 3 (Showa)	○	△
Grease Max No. 2 (Maruzen)	○	○
Albania Grease No. 3 (Shell)	○	×
Grease Darina 2 (Shell)	○	○
Gold No. 2 (Nippon Grease)	○	○

Cutting oils

Neocool AP-Cut (Matsumura Yushi)	○	△
Diatool A-4 (Daido Kagaku)	○	○
Shimiron M (Modification No. 2) (Daido)	○	×
Silicone TSM631 (Toshiba)	○	×
Silicone KM780 (Shin-Etsu)	○	×
Silicone YF3842 (Toshiba)	○	×

Rust preventatives

Rustfighter (Nippon Grease)	○	△~×
Nonruster (Yushiro Kagaku)	○	△~×
RP-6 (Shin Nippu Kagaku)	○	○

Chemicals	23°C	70°C
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Antistatic agents

Hotac	○	○
Antista ADS	○	○
Elecnon OR-S	○	○

Disinfectants

Decahydronaphthalene	○	×
Osban (Aqueous solution of 500 times)	○	○
Hibiten (Aqueous solution of 500 times)	○	○

Detergents

Alkali detergent (pH 11)	△	×
Invert soap	○	△
Mypet (Undiluted solution) (Kao)	○	○
Magiclean (Undiluted solution)	×	×
Bluedia (Lion)	○	○

Cosmetics

MG-5 hair tonic	○	○
MG-5 hair liquid	○	○
Eroica hair liquid	○	×

Foods

Whisky	○	○
Japanese Sake	○	○
Wine	○	○
Sesame oil	○	△
Salad oil	○	△
Butter	○	△

○: Items usable: Critical stress is over 13.7 MPa

△: Items requiring care in use: Critical stress is 9.8-13.7 MPa

×: Items not usable: Critical stress is less than 9.8 MPa

⚠ Caution: Above ○ marked items are considered as usable for the present, but it is required to conduct an experiment before use under the actual use condition.

Hot water resistance

Panlite has carbonate bond. When it is soaked in hot water of 80°C or above for a long period of time, it is hydrolyzed and the physical properties decline gradually. Therefore, in designing the product, due consideration should be given to its specifications.

Sanitary properties

A number of Panlite grades have been approved by the sanitation test of the Ministry of Health and Welfare notification No. 18 of the year 1994. There are also grades that meet the Japan Hygienic Olefin And Styrene Plastics Association's Self-restrictive Requirements on Food-contacting Articles Made of Polyolefins and Certain Polymers, and the sanitation standards of the FDA (Food and Drug Administration) in the US. Panlite is also approved as No. 7-738, one of the existing chemical products falling under the categories prescribed by the law concerning the examination and control of the manufacture of chemical products.