



**FORTRESS**[®]
BUILDING PRODUCTS

Apex[™]

TECHNICAL DATA SHEET



Identification

Product name: Fortress® Apex™ co-extruded mineral-polymer composite decking.

Product use: This product is primarily used for decking, facades, screens, cladding, etc.

Manufacturers information: Fortress Building Products, 1720 N. 1st St. Garland, TX 75040.

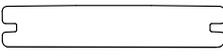
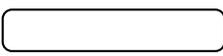
Customer Care: 866-323-476

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Technology description

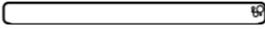
The Apex™ range was developed to provide a lightweight alternative to the Fortress® cellulose-polymer range. The foamed mineral-polymer core has improved water absorption and fire resistance behaviour. The innovative double layer polymer coat provides a unique texture and aesthetic characteristic as well as improved slip resistance.

Deck profile specification

Description	Profile width (in/mm)	Profile height (in/mm)	Typical length (in/mm)	Coverage (m/m ²)*	Mass per meter (Weight / Linear ft)	Recommended spans (in/mm)
 Grooved deck board	5.5" (140mm)	.95" (24mm)	12' (366cm) 16' (488cm) 20' (610cm)	6.9	1.57lbs / ft ²	16" OC (400)
 Square edge deck board	5.5" (140mm)	.95" (24mm)	12' (366cm) 16' (488cm) 20' (610cm)	6.9	1.57lbs / ft ²	16" OC (400)

*Coverage includes a 3/8" (5mm) gap between boards.

Fascia profile specifications

Description	Profile width (in/mm)	Profile height (in/mm)	Typical length (lf/mm)	Coverage (m/m ²)*	Mass per Weight / Linear Ft	Recommended spans (in/mm)**
 12" Fascia board	11.75" (298)	.63" (16)	2' (366)	3.4	2.06lbs / Lft	16" (400)
 8" Fascia board	7.75" (184)	.55" (14)	12' (366)	5.5	1.45lbs / Lft	16" (400)

*Coverage includes a 38/" (5 mm) gap between boards.

**Spans are based on boards in a vertical orientation.

Composition

Substance	Approximate mass	CAS Number	Agency	Exposure limit	Comment
Core					
Polyvinyl chloride (PVC)	50 %	9002-86-2	OSHA-PEL ACGIH-TLV	5 mg/m ³ (respirable dust) 10 mg/m ³ (as nuisance dust)	Thermoplastic
Calcium Carbonate (CaCO ₃)	40 %	471-34-1	OSHA-PEL NIOSH-REL	5 mg/m ³ (respirable dust) 5 mg/m ³ (respirable dust)	N/A
Bamboo fibre	3 – 10 %	N/A	OSHA-PEL OSHA-REL ACGIH-PEL ACGIH-REL	PEL-TWA 15 mg/m ³ (total dust) PEL-TWA 5 mg/m ³ (respiratory dust fraction) TLV-TWA 3 mg/m ³ (respiratory dust fraction) TLV-STEL 10 mg/m ³ (inhabitable particles)	
Foaming agent				Information withheld	
Lubricating agent				Information withheld	
Cap					
Acrylonitrile styrene acrylate (ASA)	70 – 100 %	26299-47-8	N/A	Non-hazardous material	N/A
Additives	1 – 30 %			Information withheld	
Additional additives					
Anti-mould agents, coupling agents, anti-UV agents, colour pigments, etc.				Information withheld	

NOTE

The primary composition of this product is PVC. This product contains a proprietary blend of components encapsulated within a polymer matrix. Trace impurities may be present but are in insignificant quantities to affect the purity of the product.

Bamboo is a species of the grass family which has distinct anatomical differences from that of timber. Therefore bamboo would be regulated as an organic dust in a category known as "Particulates not otherwise regulated" (PNOR), or nuisance dust by OSHA. The ACG IH classifies dust or particulate in this category as "Particulates not otherwise specified".

Mechanical properties (ASTM D790)			
Mechanical properties (4 point load at 300 mm span)	Measured value	2000 Hours weathering	Notes
Modulus of elasticity MOE (MPa)	1554	1640	
Modulus of rupture MOR (MPa)	23.6	26.0	
Creep recovery (%)	89		
Unrecoverable deflection (mm)	0.09		Test load of 302 N at a 300 mm span

Weathering effects (ASTM D6109)					
Mechanical properties (3 point load)	Conditions at 300 mm spans				
	Control	Freeze-thaw	Moisture	High temperature	Low temperature
Modulus of elasticity MOE (MPa)	1 433	1 368	1644	1 204	2 047
Modulus of rupture MOR (MPa)	22.0	22.6	24.6	19.5	41.4

Surface properties			
Finish: L			
Physical properties	Measured value	Test standard	Note
Scratch resistance (N)	7.0	FORD FLTM BO 162-01-2009	
Slip resistance	65	AS 4586 2013 Appendix A – Wet pendulum	With grain Class P5
Slip resistance	67	AS 4586 2013 Appendix A – Wet pendulum	Across grain Class P5
Slip resistance	0.95	AS 4586 2013 Appendix B – Dry floor friction	Class D1
Slip resistance (°)	34.0	AS 4586-2013 Appendix A – Wet-barefoot inclining platform	Class C
Slip resistance (°)	27.4	AS 4586-2013 Appendix A – Oil-wet inclining platform	Class R11
Abrasion (mg/r)	0.1	ASTM D4060-14	CS-17/1000 g
Shore hardness	82	ISO 868-2003	HD

Artificial weathering (3000 Hours)	Ash	ΔE 1.096	ASTM G154-7
	Cumaru	ΔE 2.256	ASTM G154-7
	Garapa	ΔE 1.721	ASTM G154-7
Artificial weathering (2000 hours) Garapa	ΔL	0.78	ASTM G154-16
	Δa	0.11	ASTM G154-16
	Δb	0.67	ASTM G154-16
	ΔE	1.04	ASTM G154-16
	Grey scale	4 - 5	ASTM G154-16

Material properties				
Physical properties		Measured value	Test standard	Note
Linear thermal expansion coefficient (°C ⁻¹)		46.2 × 10 ⁻⁶	ASTM D6341	
Bulk density (kg/m ³)		670		
Water absorption after 24 hours (%)		1.12		Mass change
Swelling after 24 hours (%)	thickness	0.09		Dimensional change
	width	0.00		
	length	0.00		
Water absorption after 28 days (%)		0.6		Mass change
Fire reaction classification		Bfl -s ₁	EN 13501-1	
Critical flux (kW/m ²)		11.0	EN ISO 9239-1	
Smoke (% x minutes)		254.0	EN ISO 11925-1	
Fs ≤ 150 mm		Yes	EN ISO 11925-1	

Installation points

Standards

Legislation may differ between jurisdictions. Before installing any Fortress Building Products, ensure that the application is rational and complies with the local regulations and building codes. Wherever necessary, consult a suitably qualified professional. Be sure to comply with material manufacturer specifications. Where manufacturers and building codes differ, revert to the building code requirements. Check that your choice of product is suitable for its intended application. For further product specification and information visit www.Fortressbp.com.

Safety

- Always wear appropriate personal protection equipment (PPE). Comply with the local occupational health and safety legislation.
- Refer to the applicable Material Safety Data Sheet (MSDS).
- Cutting Apex™ produces fine particulate matter.
 - Work in well-ventilated areas.
 - Wear dust masks during cutting, drilling and cleaning.
 - Clean up saw-dust by vacuuming or wetting the area down and sweeping.
 - Always wear safety goggles whilst cutting and/or installation.
- Cut boards may have sharp edges (particularly mitered cuts).
 - Wear gloves when working with boards.
- About California Proposition 65 <https://fortressbp.com/about/californiaproposition65>

Storage and handling

- Individual boards are lighter than WPC and can be more easily handled. Boards are, however, bundled for convenience and can, as a result, be heavy. Take care when lifting, placing or removing from raised pallets. More than one person may be required for lifting depending on the length of the boards and the number of boards within a bundle. Ensure the mass handled does not exceed safe limits as defined by applicable local legislation.
- When handling lengths of boards greater than 12', ensure both ends are lifted simultaneously and evenly. Lift the boards 3' from each end to provide better control.
- Handle the boards carefully. Dropping the boards (and all high impact loads in general) can result in damage to the profiles.
- During transportation use corner protectors where strapping is required.
- All components should be stored completely under cover.
- When storing boards, a pallet or flat surface should be used to support the full length of each component.
- All components should be securely stored.
- No component should sit in water or similar.
- Avoid over-stacking and/or eccentric stacking.

Plan

- Assess the site environment and ensure the product is suitable for the intended application.
- Classify the corrosion category, loading class, and any other property that will influence the selection of product.
- Determine appropriate spans for the selected profile. This will depend on the application and the loading class for the region. Suggested spans are provided for typical residential scenarios (refer to Installation guide).
- An appropriately qualified professional must be consulted whenever necessary to ensure the product, this document and the intended application complies with all applicable legislation for that region.
- Develop a maintenance plan to ensure the longevity of the system. This should consider drainage, corrosion and vegetation under and around the deck.

Site preparation

- Ensure adequate drainage below the deck footprint. Prevent pooling water and/or erosion.
- Remove vegetation from the deck footprint and place an appropriate geotextile to prevent regrowth.

Cutting

- Use a fine toothed, carbide tipped blade to cut Apex™ material.
 - Use an 80-tooth, 260 mm diameter cross-cut, or finer, blade.
- Do not rip boards thinner than 2.5". Use a minimum of two fasteners per joist, evenly spaced and a minimum of 1" from any board edge.
- Apex™ boards are provided as factory cut. Ends should be trimmed to carpentry cut.
- Boards can be mitered. Use two fasteners, evenly spaced and a minimum of 1" from any edge, per mitered board.
- Do not router Apex™ boards.

Fastening

- Do not use nails to fasten Apex™ boards.
- Use high quality fasteners suitable for the life span of the deck and the atmospheric conditions of the site.
 - Stainless steel 316 fasteners should be used in environments classified as C5 or higher.
- A drill or screwdriver with adjustable torque settings is recommended.
 - See required torque settings in the typical fasteners section. Do not exceed the recommended torque settings.
- Apex™ boards require two fasteners points per joist.
- Fasten 1" from any edge of a board.
- Pre-drill composite in temperatures below 40°F.
 - Pre-drilling hole size should be equal to the minor/root diameter of the screw.
- Do not pre-drill timber substructure.
- Pre-drilling metal substructure may influence the effectiveness of the screw wings.
- core collapse as a result of too much downward force when fastening).

Board Application

- The installation of Apex™ boards is comparable to that of other composite or timber decking materials.
 - Refer to Apex™ decking installation guide for details.
- Apex™ profiles are not intended for use as structural members.
- Provide ground clearance for adequate ventilation. Improved ventilation can have the added benefit of assisting with expansion and contraction.
- The overhang of boards must be limited to 1".
- Leave expansion gaps between boards. The linear expansion coefficient of Apex™ is $46.2 \times 10^{-6} \text{ } ^\circ\text{C}^{-1}$. For further details on expansion and contraction, refer to the full installation guide.
- Reflective surfaces (for example, low-E glass or metallic roofing) may cause unusual UV impact and/or heat build-up on a deck which may cause unexpected results in the Apex™ material. Design your deck to cater for this where possible.
- Use a breaker board between longitudinal boards to assist in controlling expansion and contraction. This approach has the added benefit of creating a neat aesthetic. See Installation guide for further details.
 - Breaker boards must be supported by ladder joists or noggins.
- Where breaker boards cannot be used, and longitudinal boards butt up against one another, double joists must be used to support the butt joint. Use a minimum of two fasteners per joist, evenly spaced and a minimum of 1" from any board edge. Ensure longitudinal boards in this scenario are top fixed at every joist.
 - Stagger butt joints so that they do not all align on the same joist. This limits unsightly repetition of expansion gaps.
- Joist spans should be altered in cases where boards are installed diagonally (for example, with Herringbone patterns). See Installation guide for details.

Care and maintenance

General care

- Wash Apex™ decking periodically using standard household cleaners.
 - Strong detergents, oxidisers and concentrated mineral acids, aromatic and/or halogenated hydrocarbons, esters, ethers, and ketones should be avoided.
 - Water, aqueous salt solutions, detergent solutions, dilute acids and alkalis are acceptable.
 - To ensure that the cleaner will not damage the cap, test a small patch of decking or a scrap piece of Apex™ material before use. See Appendix A for an Apex™ chemical compatibility table.
 - Do not use standard composite deck cleaners on Apex™.
- Clean up spills as soon as is possible to prevent them from becoming stains.
 - Certain chemicals in insect sprays, sunblocks, oils from certain plants, and undiluted chlorine are some common materials that may come in contact with your deck and are not compatible with the ASA cap. Refer to Appendix A for a more comprehensive list. Prevent these materials from interacting with the Apex™ boards.
 - Items such as rubber mats and garden hoses may leach esters, which may affect the surface of the Apex™ boards over time, care should be taken to prevent prolonged exposure.
- Periodically move, or remove, furniture, door mats, planters and other deck accessories to avoid differential weathering.
- PVC glues, cement, paint, etc. may damage and discolour the surface of the deck. To prevent this from occurring, install Apex™ after all masonry and painting work has been completed on site.
- A toilet bowl cleaner, or similar bristled brush, can be used to remove rust, or similar, stains.
- For particularly stubborn stains, the surface can be gently sanded. This naturally removes material from the protective cap and should be avoided as it may affect the surface of the board.
- Mineral deposits that occur as a result of the evaporation of solutions with high salt contents can leave white residues on a deck surface. The primary cause(s) of this is due to the water quality and/or surrounding environment. One should avoid allowing water with a high mineral content to pool on the deck surfaces where possible. These residues can be cleaned with the methods prescribed above. For any further assistance please contact us at Fortress customer care or technical instaed.

Ice and snow

- Typical materials used to clean ice and snow from surfaces that contain calcium chloride and/or sodium chloride may be used on Apex™ boards. As discussed above, these may leave a white residue on the deck. These can, however, be cleaned with the methods prescribed above.
- Do not use metal shovels or other sharp objects on the Apex™ surface. Use a plastic shovel and rounded/beveled tools when scrapping off ice or similar.
- Note that surface slip resistance will be reduced with ice, snow or similar present and care should be taken on these occasions.

Static charge

- The development of static charge between two differing materials in contact (referred to as the triboelectric effect) is a naturally occurring phenomenon. The strength of the charge depends on the relative positions of the materials on the triboelectric series and the environment they are installed in. Materials with greater polarity that are in a dry and low humidity environment will have a stronger charge upon separation of the two materials.
- Static charge buildup can be reduced by grounding the deck structure and/or increasing the humidity of the environment. Static discharge can be avoided in particular areas (for example, access points) with the placement of static control grounding mats.

Care and maintenance

Maintenance

- Apex™ is a low maintenance material and only requires periodic cleaning.
 - In extraordinary circumstances where stains take place, use the prescribed methods above to remove stains.
- A regular maintenance program for the deck and its components can prolong the combined life span of the deck.
 - Regularly inspect and conduct proactive maintenance to deck structures and fasteners.
 - Before installing the boards and trim, conduct a detailed inspection of areas that will have limited accessibility once boards and/or trim are installed and ensure that areas of concern are adequately treated.
 - Pay attention to areas at risk of corrosion and ensure that all surfaces are appropriately coated.
- Specify materials in accordance with the environmental conditions so that the life of your deck structure at least matches the life of the Apex™ deck materials.
 - Structural materials such as treated timber can be purchased in accordance with atmospheric conditions.
 - Metal structures should be galvanised and treated for atmospheric conditions. Additional layers of protective paint can be applied to extend the life of a galvanised structure and periodic maintenance can extend the life of a protective paint barrier.
 - Rust spots should be treated as and when they occur to avoid having to replace a metal structure prematurely.
 - Fasteners used in structural applications should be painted over before decking is applied to prolong their life.
 - Fasteners should be specified for the environment in which they are installed.
 - Cut edges of structures (treated timber or galvanised metal) should be treated and sealed once again before decking is installed.

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Appendix A - ASA chemical compatibility table

Test substance	20 °C	50 °C
Acetamide	+	+
Acetic acid (100 %)	-	-
Acetic acid (25 %)	+	+
Acetic acid (50 %)	+	o
Acetone	-	-
Acetophenone	-	-
Acetylsalicylic acid (soln.)	+	+
Allyl alcohol	-	-
Allyl mustard oil	-	-
Almond, bitter, oil of	+	o
Almond, oil of	+	+
Alum (soln.)	+	+
Aluminium chloride (soln.)	+	+
Aluminium sulphate (soln.)	+	+
Ammonia, aqueous (25 %)	+	+
Ammonium carbonate (soln.)	+	+
Ammonium chloride (soln.)	+	+
Ammonium molybdate (soln.)	+	+
Ammonium nitrate (soln.)	+	+
Ammonium rhodanide (soln.)	+	+
Ammonium sulphate (soln.)	+	+
Amyl acetate	-	-
Amyl acetate	-	-
Amyl alcohol	+	o
Amyl cinnamaldehyde	-	-
Amyl mercaptan	-	-
Aniline	-	-
Anise, oil of	-	-
Aniseed	+	+
Apple juice	+	+
Aqua regia	o	-
Atropine sulphate	+	+
Barium bromide (soln.)	+	+
Barium carbonate (soln.)	+	+
Barium chloride (soln.)	+	+
Beef tallow	+	+
Benzaldehyde	-	-
Benzene	-	-
Benzoic acid	+	+
Benzyl acetate	-	-
Benzyl acetate	-	-
Benzyl alcohol	-	-
Bismuth chloride (soln.)	+	+
Bismuth subnitrate (soln.)	+	+
Bone oil	+	+
Borax (soln.)	+	+
Boric acid (soln.)	+	+
Brake fluid (ATE)	-	-
Brandy	+	+
Bromine (liquid)	-	-
Butane	+	+
Butter	+	+
Butyl acetate	-	-
Butyl acetate	-	-
Butyric acid	-	-
Cadmium bromide (soln.)	+	+
Caffeine (soln.)	+	+
Calcium bromide (soln.)	+	+
Calcium chloride (soln.)	+	+

Test substance	20 °C	50 °C
Gallic acid	+	+
Garlic (powder)	+	+
Gasoline (Premium unleaded)	o	-
Gasoline (Standard unleaded)	o	o
Ginger (ground)	o	o
Glucose (30 %)	+	+
Glycerine	+	+
Grapefruit juice	+	+
Gravy	+	+
Heating oil	+	+
Heptane	o	o
Heptyl alcohol	+	o
Hexachlorobenzene	+	+
Hexane	o	o
Hexanediol	+	+
Hexanol	+	o
Honey	+	+
Horse radish	+	+
Household detergent (soln.)	+	+
Hydrochloric acid (15 %)	+	o
Hydrochloric acid (conc.)	+	o
Hydrofluoric acid (40 %)	o	o
Hydrogen peroxide (3 %)	+	+
Hydrogen peroxide (30 %)	+	+
Hydrogen sulphide	+	+
Hydroquinone (soln.)	+	o
Hydroxyacetone	o	o
Ink, writing	+	+
Iodine, tincture of	o	-
Iron (II) chloride (solid)	+	+
Iron (II) chloride (soln.)	+	+
Iron (II) sulphate (solid)	+	+
Iron (III) chloride (soln.)	+	+
Iron ammonium sulphate	+	+
Iron nitrate (soln.)	+	+
Isoamyl alcohol	+	o
Isobutanol	o	-
Isooctane	+	+
Isooctane	+	+
Isopropanol	+	-
Isopropyl acetate	-	-
Lactic acid (10 %)	+	+
Lactic acid (80 %)	+	+
Lactose (soln.)	+	+
Lanolin +	+	+
Laurel (ground)	+	+
Lauryl alcohol	+	+
Lead acetate (soln.)	+	+
Lead nitrate (soln.)	+	+
Lead stearate	+	+
Lead sulphate (soln.)	+	+
Lemon grass, oil of	-	-
Lemon juice	+	+
Lemon, oil of	o	o
Ligroin	+	+
Lime water	+	+
Linseed oil	+	+

Test substance	20 °C	50 °C
Potassium bromide (soln.)	+	+
Potassium chloride (soln.)	+	+
Potassium chromate (soln.)	+	+
Potassium dichromate (soln.)	+	o
Potassium ferricyanide	+	+
Potassium fluoride (soln.)	+	+
Potassium hydroxide (10 %)	+	+
Potassium hydroxide (50 %)	+	+
Potassium hydroxide (concentrated soln.)	+	o
Potassium iodate (soln.)	+	+
Potassium iodide (soln.)	+	+
Potassium nitrate (soln.)	+	+
Potassium permanganate (soln.)	+	o
Potassium persulfate (soln.)	+	+
Potassium sulphate (soln.)	+	+
Potassium sulphide (soln.)	+	+
Prontosil	+	+
Propane (liquid)	+	+
Propane (liquid) chloride	-	-
Propane glycol	+	+
Propylene glycol methyl ether	-	-
Propylene oxide	-	-
Pyridine	-	-
Pyrogallol (soln.)	+	o
Resorcin (soln.)	o	o
Rongalite (soln.)	+	+
Roses, oil of	o	o
Rum	+	+
Rum essence	+	+
Salicylic acid (soln.)	+	+
Salt, common (dry)	+	+
Sandalwood, oil of	-	-
Sassafras oil	-	-
Sea water	+	+
Sebacic acid dibutyl ester	-	-
Silicone fluid	+	+
Silver nitrate (soln.)	+	+
Sodium acetate (soln.)	+	+
Sodium benzoate (soln.)	+	+
Sodium bicarbonate (soln.)	+	+
Sodium bisulfite (soln.)	+	+
Sodium borate (soln.)	+	+
Sodium bromate (soln.)	+	+
Sodium bromide (soln.)	+	+
Sodium carbonate (soln.)	+	+
Sodium chloride (dry)	+	+
Sodium chloride (soln.)	+	+
Sodium chromate (soln.)	+	+
Sodium fluoride (soln.)	+	+
Sodium hydrogen sulfite	+	+
Sodium hydroxide (50 %)	+	+
Sodium hypochlorite (soln. with 12 % Cl)	+	+
Sodium hypochlorite (soln., 12 % chlorine)	+	+
Sodium nitrate	+	+
Sodium nitrite	+	+
Sodium perborate (soln.)	+	+
Sodium phosphate (sec.) (soln.)	+	+
Sodium phosphate (tert.) (soln.)	+	+
Sodium sulphate (soln.)	+	+

Appendix A - ASA chemical compatibility table

Test substance	20 °C	50 °C
Calcium hypochlorite (solid)	+	+
Calcium hypochlorite (soln.)	+	+
Calcium oxide	+	+
Camphor	+	+
Caraway seed (ground)	+	+
Carbazole	+	+
Carbon dioxide	+	+
Carbon sulphide	-	-
Cardamom	+	+
Carnauba wax	+	+
Carrot juice	+	+
Castor oil	+	+
Cellosolve (methyl-, ethyl-, propyl-, butyl-)	-	-
Cesium bromide (soln.)	+	+
Cetyl alcohol	+	+
Chamomile extract	+	+
Chlorinated lime	+	+
Chlorine (liquid or gaseous)	-	-
Chlorine water	o	o
Chloroacetic acid	o	-
Chlorobenzene	-	-
Chloroform	-	-
Chlorosulfonic acid	-	-
Chromic acid (soln.)	o	o
Chromosulfuric acid	o	o
Cider (apple)	-	-
Cinnamic aldehyde	-	-
Cinnamon (ground)	+	+
Cinammon (sticks)	+	+
Citric acid (soln.)	+	+
Citronella, oil of	-	-
Cloves	-	-
Cloves, oil of	-	-
Cocoa butter	+	+
Coconut oil	+	+
Cod-liver oil	+	+
Coffee (ground)	+	+
Coffee extract	+	+
Copper sulphate (soln.)	+	+
Corn oil	+	+
Cottonseed oil	+	+
Cresol (para)	o	-
Curry	+	+
Cyclohexane	+	o
Cyclohexanol	+	o
Cyclohexanone	-	-
Dairy products	+	+
Dehydroacetic acid	+	+
Dekalin (R)	o	o
Diacetone alcohol	-	-
Dibutyl phthalate	-	-
Dichlorobenzene	-	-
Diesel oil	+	+
Diethanolamine	+	+
Diethyl ether	-	-
Diethyl hexyl phthalate	+	o
Diethyl ketone	+	+
Diethyl phthalate	-	-
Diethylene glycol	+	+
Diisodecyl phthalate	o	o
Dimethyl diglycol phthalate	o	o
Dimethyl phthalate	-	-
Dimethylformamide	-	-

Test substance	20 °C	50 °C
Mace (ground)	+	o
Magnesium bromide	+	+
Magnesium carbonate	+	+
Magnesium chloride (soln.)	+	+
Magnesium sulphate (soln.)	+	+
Maize oil	+	+
Malic acid (10 %)	+	+
Mandarin orange, oil of	o	o
Margarine	+	+
Marjoram (ground)	+	+
Marmelade	+	+
Mayonnaise	+	+
Menthol (10 % in ethanol)	o	o
Mercury	+	+
Mercury chloride (soln.)	-	+
Mesityl oxide	-	-
Methanol	o	-
Methyl acetate	-	-
Methyl butanol	+	o
Methyl chloride	-	-
Methyl cyclohexane	+	+
Methyl ethyl ketone	-	-
Methyl isobutyl ketone	-	-
Methyl isopropyl ketone	-	-
Methyl propyl ketone	-	-
Methyl salicylate	-	-
Methylene chloride	-	-
Methylene chlorobromide	-	-
Milk	+	+
Milk powder	+	+
Milk powder (moist)	+	+
Monoamyl phthalate	-	-
Motor oil (automotive)	+	+
Mustard	+	+
n-Butanol	+	o
n-Nonanol	+	+
n-Octanol	+	+
n-Propanol	+	o
Naphthalene (solid)	o	-
Naphthalene (soln. in ethanol)	+	-
Naphthol (beta) (soln. in ethanol)	o	-
Nickel sulphate (soln.)	+	+
Nitric acid (30 %)	+	o
Nitric acid (conc.)	-	-
Nitrobenzene	-	-
Nutmeg, dark (ground)	o	o
Nutmeg, light (ground)	+	o
Nutmeg, oil of	o	-
Oleic acid	+	o
Olive oil	+	+
Onion (powder)	+	+
Orange juice	+	+
Orange, oil of	o	o
Oxalic acid (soln.)	+	+
Oxymethylfurfural	-	-
Ozone (<0,5 ppm)	+	+
Palamol 644 und 646 (polyesters based on adipic acid, BASF)	-	-
Palm oil	+	+
Palmitic acid	+	+
Paprika (ground)	+	+
Paraffin oil	+	+
Peanut oil	+	+
Peanut oil	+	+
Pectin (soln.)	+	+
Penicillin	+	+
Pentane	o	o
Pepper (black or white, ground)	+	o
Peppermint, oil of	-	-

Test substance	20 °C	50 °C
Sodium sulphide (soln.)	+	+
Sodium sulfite (soln.)	+	+
Sodium thiosulfate (soln.)	+	+
Soy oil	+	+
Sperm oil	+	+
Stearic acid	+	+
Strontium bromide	+	+
Strychnine	+	+
Sugar (soln, 30 %)	+	+
Sulphur	+	+
Sulphur hexafluoride	+	+
Sulfuric acid (10 %)	+	+
Sulfuric acid (38 %, battery acid)	+	+
Sulfuric acid (50 %)	+	+
Sulfuric acid (conc.)	-	-
Tannic acid	+	+
Tartaric acid (soln.)	+	+
Tea leaves (moist)	+	+
Tea, instant	+	+
Tetrachlorethane	-	-
Tetrachloromethane	-	-
Tetrahydrofuran	-	-
Tetrahydrofurfural	-	-
Tetralin (R)	-	-
Thionyl chloride	-	-
Thiophene	-	-
Thymol	-	-
Tin (II) chloride (soln.)	+	+
Tin (IV) chloride (soln.)	-	-
Titanium tetrachloride	-	-
Toluene	-	-
Tomato juice	+	+
Tragacanth (gum tragacanth)	+	+
Transformer oil	+	o
Trichlorobenzene	-	-
Trichloroethane	-	-
Trichloroethylene	-	-
Trichlorophenol	-	-
Tricresyl phosphate	-	-
Triethanolamine	+	+
Triethylene glycol	+	+
Triglycol acetate	-	-
Trypaflavin (R)	+	+
Tryptophane (d or l)	+	+
Turpentine	o	o
Turpentine substitute	+	o
Tyrosine (d or l)	+	+
Undecanol	+	+
Urea (soln.)	+	+
Urotropin (soln.)	+	+
Valerian drops	+	+
Verbena oil	-	-
Vinegar	+	+
Water	+	+
Water colors	+	+
Water glass	+	+
Wax (bleached)	+	+
White oil	+	+
Xylene	-	-
Zinc bromide	+	+
Zinc carbonate	+	+
Zinc chloride (soln.)	+	+
Zinc nitrate	+	+
Zinc ointment	+	+
Zinc oxide	+	+

Appendix A - ASA chemical compatibility table

Test substance	20 °C	50 °C	Test substance	20 °C	50 °C	Test substance	20 °C	50 °C
Dinonyl phthalate	o	o	Perchloroethylene	o	o	Zinc stearate	+	+
Dioxane (1,4 dioxane)	-	-	(Tetrachloroethylene)			Zinc sulphate (soln.)	+	+
Diphenyl ether	-	-	Petroleum ether	o	o			
Diphenylamine	-	-	Petroleum jelly	o	-			
			Petroleum jelly	+	+			
Ethanol (40 %)	+	+	Phenacetin	+	+			
Ethanol (95 %)	+	o	Phenol	-	-			
Ether (Diethyl ether)	-	-	Phenylethanol	-	-			
Ethyl acetate	-	-	Phosphoric acid (1%)	+	+			
Ethyl benzene	-	-	Phosphoric acid (30 %)	+	+			
Ethyl benzoate	-	-	Phosphoric acid (85 %)	+	+			
Ethyl chloride	-	-	Phthalic acid (soln.) Pimento (ground)	+	+			
Ethylene chloride	-	-	Pine needles, oil of	o	-			
Ethylene glycol	+	+	Pineapple juice	+	+			
Eucalyptus, oil of	o	o						
			Plastomoll DOA	o	o			
Fertilizer salts	+	+	(di-(2-ethyl-hexyl) adipate, BASF)					
Formaldehyde (30 %)	+	o	Pork lard	+	+			
Formic acid (40 %)	+	o						
Formic acid (85 %)	o	o	Potassium aluminium	+	+			
Frigen/Freon 11	o	o	sulphate (soln.)					
(Monofluoro- trichloromethane)			Potassium bisulfate	+	+			
Frigen/Freon 113	o	o						
(Trifluoro-trichloroethane)			Potassium bromate (soln.)	+	+			
Frigen/Freon 114	o	o						
(Tetrafluoro-dichloroethane)								
Frigen/Freon 12	o	o						
(Difluoro-dichloromethane)								
Frigen/Freon 21 (Monofluoro-	-	-						
dichloromethane)								
Frigen/Freon 22	-	-						
(Difluoro-monochloro- methane)								
Furfural	-	-						
Furfuryl alcohol	o	-						

Symbol legend

The symbols and abbreviations used have the following meanings

+	= resistant over a period of months to years
o	= limited resistance: some swelling, solvation or environmental stress cracking is possible
-	= not resistant: severe swelling, decomposition, solvation or environmental stress cracking
soln.	= saturated aqueous solution

Resistance definition

Good resistance	Water, aqueous salt solutions, detergent solutions, dilute acids and alkalis.
Limited resistance	Alcohols, aliphatic hydrocarbons, oils and fats.
Not resistant	Concentrated mineral acids, aromatic and/or halogenated hydrocarbons, esters, ethers, ketones.
Solvents	Examples are methyl ethyl ketone, tetrahydrofuran, toluene, dimethyl-formamide.

Source data:

BASF – Chemical resistance of styrene co-polymers

www.basf.de/plastics



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