Shat-R-Shield Incoplas™ Hybrid Hazardous Locations Chemical Resistance

The Hybrid LED fixture is manufactured with three different polycarbonate materials. All of the materials have ULF1 outdoor rating. The fixture passes UL1598A Outdoor and Marine Vessel certification. These test the durability and extended life in outdoor and harsh marine environments. The tests include long term accelerated exposure to UV and salt spray.

The unique one of a kind benefit of Shat-R-Shield's Incoplas™ international award winning line of fixtures are that they are made completely of non-metal materials except the screws which are Stainless Steel 316 to hold up to the harshest environments.

The Hybrid plastics are made from a variety of high impact outdoor rated polycarbonate resins. The unique feature of the housing is that is made of a specially compounded thermally conductive polycarbonate resin. This allows for excellent heat transfer and heat management of the LED junction temperature and eliminated the typical aluminum housing which has coatings that are highly receptive to corrosion and degradation.

The Hybrid fixture has not been tested for chemical resistance to all chemicals. The data listed below is taken from chemical resistance charts supplied by compounders of Polycarbonate. Shat-R-Shield highly recommends that the fixture is tested in the chemical environment application.

Resistant chemicals:

Amyl Alcohol
Alum
Aluminum Chloride
Aluminum Sulphate
Ammonium Chloride
Ammonium Nitrate
Ammonium Sulphate
Antimony Trichloride
Arsenic Acid 20%
Benzine - free from aromatic hydrocarbons
Butyl Alcohol
Calcium Nitrate
Calcium Sulphate
Chlorinated Lime Paste
Chlorine (air)
Chlorine Dioxide
Chrome Alum
Chromic Acid 20%
Citric Acid 40%
Copper Chloride
Copper Sulphate
Cuprous Chloride
Cupric Sulfate 50%
Ethanol (pure)
Ethylene glycol, 1:1 with water
Ferric Chloride (gas)
Ferric Sulfate
Ferrous Sulfate
Formalin 30%
Formic Acid 10%
Freon 12
Glycerine
Heptane
Hexane
Hydrochloric Acid 50%
Hydrofluoric Acid 10%
Hydrogen Chloride 20%
Hydrogen Peroxide
Hydrogen Peroxide 30%
Hydrogen Sulphide
Iron(III) chloride, saturated/aqueous solution
Iron Salts
Isooctane (2,2,4-trimethyl pentane), pure
Isopropanol
Lactic Acid 20%
Magnesium Chloride
Magnesium Sulphate
Manganese Sulphate
Mercuric Chloride
Nickel Sulphate
Nitric Acid 10%
Nitric Acid 20%
Oleic Acid
Oxalic Acid
Paraffin, paraffin oil, pure/free from aromatic hydrocarbons
Pentane
Phosphoric Acid 10%
Potassium Bromate
Potassium Bromide
Potassium Chloride
Potassium Nitrate
Potassium Perchlorate
Potassium Permanganate
Potassium Persulphate
Potassium Sulphate
Propane
Selenious Acid 60%
Silicone Oil
Silver Nitrate 50%
Sodium Aluminate
Sodium Bicarbonate
Sodium Bisulphate
Sodium Carbonate
Sodium Chlorate
Sodium Chloride
Sodium Hydroxide 20%
Sodium Hypochlorite
Sodium nitrate,10 % in water
Sodium Sulphate
Stannous Chloride
Sulfur
Sulfuric Acid 50%
Tartaric Acid 30%
Triethylene glycol
Zinc Chloride
Zinc Sulphate

Industrial petroleum products:

Axle Oil
Compressor Oil
Diesel Oil
Kerosene
Refined Oil
Silicone Oil
Spindle Oil
Transformer Oil
Vacuum Pump Oil

Common household materials:

Beer
Borax
Cocoa
Cement
Chocolate
Cod
Cognac
Coffee
Detergents (nonionic and anionic)
Fish Oil
Fruit Syrup
Grapefruit Juice
Gypsum
Joy Liquid Detergent
Insulating Tape
Linseed Oil
Liver Oil
Liquor
Milk
Mineral Water
Mustard
Olive Oil
Onions
Orange Juice

Common household materials, continued:

Paraffin Oil
Rapeseed Oil
Rum
Salad Oil
Salt Solution 10%
Table Vinegar
Tincture of Iodine 5%
Tomato Juice
Vodka
Washing Soap
Water
Wine

Limited resistance to:

Anti-freeze
Calcium Chloride
Cyclohexanol
Ethylene Glycol
Hydrochloric Acid (concentrate)
Lime (Calcium Oxide)
Milk of lime (CaOH)
Nitric Acid (concentrate)
Ozone (Fair)
Rosine Amine Salts
Sulfuric Acid (concentrate)
Sodium Hypochlorine

Not resistant to:

Acetaldehyde
Acetic Acid (concentrate)
Acetone
Acetonitrile
Acrylonitrile
Ammonia
Ammonium Fluoride
Ammonium Hydroxide
Ammonium Sulfide
Benzene
Benzoic Acid
Benzyl Alcohol
Brake Fluid
Bromobenzene
Butyric Acid
Calcium Carbonate
Carbon Disulfide
Carbon Tetrachloride
Carbonic Acid
Caustic Potash Solution 5%
Caustic Soda Solution 5%
Chloride
Chlorobenzene
Chloroform
Chlorothene
Cutting Oils
Cyclo Hexanone
Cyclohexene
Dimethyl Formamide
Dimethyl Sulfoxide
Ethane Tetrachloride
Ethyl Acetate
Ethyl Ether
Ethylamine
Ethylene Chlorohydrin
Formic Acid (concentrate)
Freon (refrigerant & propellant)
Gasoline
Jet Fuel
Lacquer Thinner
Methyl Alcohol
Methyl Ethyl Ketone (MEK)
Methylene Chloride
Mineral Spirits
Nitrobenzene
Nitrocellulose Lacquer
Ozone
Phenol
Phosphorous Hydroxy
Phosphorous Trichloride
Potassium Hydroxide
Propionic Acid
Sodium Sulfide
Sodium Hydroxide
Sodium Nitrate
Tetradydronaphthalene
Thiophene
Toluene
Turpentine
Urea
Xylene

Chemical Class

Acids	No effect under most conditions of concentration and temperature.
Alcohols	Generally compatible.
Alkalais	Acceptable at low concentration and temperature. Higher concentrations and temperatures result in etching and attack as evidenced by decomposition.
Aliphatic Hydrocarbons	Generally compatible.
Amines	Surface crystallization and chemical attack.
Aromatic Hydrocarbons	Solvents and severe stress-cracking agents.
Detergents and Cleaners	Mild soap solutions are compatible. Avoid strong alkaline ammonia materials.
Esters	Cause severe crystallization. Partial solvents.
Gasoline	Not compatible at elevated temperatures and stress levels.
Greases and Oils	Pure petroleum types generally compatible. Many additives used with them are not, thus materials containing additives should be tested.
Halogenated Hydrocarbon	Solvents and severe stress-cracking agents.
Ketones	Cause severe crystallization and stress-cracking.
Silicone Oils & Greases	Generally compatible up to 80°C.

In general, polycarbonate has good resistance to water, organic and inorganic acids, neutral and acid salts and aliphatic and cyclic hydrocarbons. Alkalines, amines, ketones, esters and aromatic hydrocarbons attack polycarbonate.

This chemical and solvent resistant listing is intended to assist designers in determining whether the Hybrid fixture can be used in certain environments. It is very important to test the fixture under end-use conditions for final verification of performance. All data is based on 70°F and 0% strain.