

SUNTUF® Technical Guide

Corrugated Polycarbonate Sheet

PALRAM

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SUNTUF is a light-transmitting polycarbonate sheet for rooflights & sidelights applications in industrial, agricultural & commercial structures.

SUNTUF rooflights profile is matched to that of the roof cover panels, directly replacing the opaque sheets as an in-plane rooflights.

An advanced profile matching capability makes SUNTUF available in a wide range of profiles that matches the majority of metal profiles on the market. It can be integrated with metal sheets at any location where natural lighting is desired.



Typical Applications

- Construction and Industry
- Skylights, rooflights and sidelights
- Architectural structures
- Industrial facilities
- Public buildings
- Canopies and shelters for car parks, swimming pools, walkways etc.
- Partitions
- Agriculture
- Commercial greenhouses
- Garden centers

Durable Against Impact

Optimized Light & Shade Balance

All Year Round

UV Protection

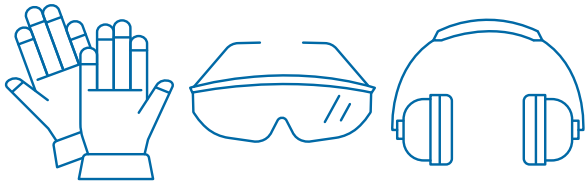
High Fire Rating

Low Maintenance

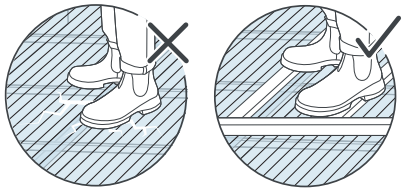
Safety

The following safety measures should be followed during and after installation of SUNTUF panels.

- Wear protective clothing while handling and processing SUNTUF panels.
- Use the proper safety equipment at any of the handling and processing activities.
- Follow the local safety regulation codes.



- Use ladders, crawling boards and other safety equipment required for safe installation. Ladders and crawling boards must be laid crosswise to corrugation.
- Never leave loose SUNTUF panels on the roof, until all the required fasteners have been appropriately installed or the panels temporarily secured to the supporting structure.
- Never step directly on installed panels for fear of falling. Use a sturdy board or ladder adequate to support your weight and long enough to span at least three structural members.
- Use the proper safety equipment wear protective clothing while applying SUNTUF panels.
- Work according to the local safety regulations codes.



Handling and storage guidelines

- Transport and store SUNTUF panels horizontally, on flat, sturdy pallets, equal or longer than the longest panels. Short panels should be stacked on top of longer ones. The panels should be secured and fastened to the pallet during transportation.
- SUNTUF Industrial sheets leave factory packaged & wrapped in white, watertight polyethylene. The wrapping should be removed as close as possible to the actual time of installation.
- Avoid storing unwrapped sheets.
- Store SUNTUF panels in a cool, dry and shaded place, protected from direct sunlight. Avoid covering the stack of panels with dark or heat-absorbing materials or objects, to prevent solar heat buildup.
- When storing panels outdoors, can not be avoided cover the stack with a white opaque material, which does not absorb or conduct heat. Verify that the entire stack is covered.
- In addition, the steps below are recommended while handling:
  - Protect the sheets from any physical damage.
  - Avoid stepping or driving on the panel when it on the ground.
  - Avoid folding panels across the corrugation during handling and installation.
  - Do not drag the panels on the ground or scrape them against structural elements or other rough objects.
  - Avoid contact or environment of chemicals.

Processing

Cutting - SUNTUF panels can be cut easily by standard power or manual tools, like:

Circular saw, jigsaw, handsaw, scissors (for low thickness).

Cutting with a circular table saw is the most recommended method for efficient, accurate and smooth cutting. Portable circular saw is suitable for on-site cutting.

Use fine toothed blades designated for plastics cutting. Apply high blade speed with moderate feeding rate. For better results cut a few panels together.

When cutting, Support the sheets close to the cutting line. Panels should be pressed down during sawing to avoid vibrations.

A jigsaw may be used for limited length cutting or curved lines. Hand tools such as handsaw, metal shears, hand-held cutting knives, or scissors can be used for localized, limited jobs.

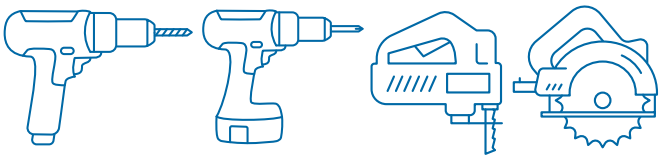
For intersecting cuts, drill a hole at the intersection point and cut the panel up to the hole.

Drilling - Pre-drilling of the fasteners holes is obligatory..

Drilling in SUNTUF panels can be done using standard power drill with regular high-speed Ø10mm steel bits intended for metal, rotating at about 1,000 RPM.

Hold or clamp the drilled panel down to avoid vibrations or free movement during operation.

Avoid making holes by punching.



Roof details

Pitch - The minimum recommended roof pitch for SUNTUF application is 6º (10% slope). This is the basic factor for SUNTUF loading data and installation details.

Installing SUNTUF on a lower pitch require using full sealing system, and smaller roof span.

SUNTUF panels are not applicable on roof pitch lower than 3º (5% slope).

Purlins - Roof purlins must have a level face parallel to the roof plane.

Minimum purlins dimensions:

- Metal structure: width 40mm and minimum thickness 2.5mm.
- Wooden structure: width 40mm and minimum height 40mm.

Pre-painted purlins must be fully dried before placing the SUNTUF panels.

For clear SUNTUF onto wooden purlins, apply white acrylic paint, or aluminum protective tape on top of the purlins, in order to prevent over-heating of the purlins surface.

The allowed max. roof span (purlins distance – center to center) data is available in the SUNTUF Data Sheet of the designed profile.

Curved roof - SUNTUF panels are suitable for curved roof.

Refer to the SUNTUF Data Sheet for minimum applicable radius.

Positioning

Always install SUNTUF with UV protected side facing out.

The protected side is marked by the labeled strip. Remove the marking strip shortly after installation.

Lay the SUNTUF panel to overlap metal panels on both sides.

If not feasible, SUNTUF rooflight panels must underlap the metal roof panels side against the primary direction of rain.

SUNTUF panels must be positioned and installed without any stress.

Do not pull, stretch or force the sheets if the profiles are not perfectly matched.

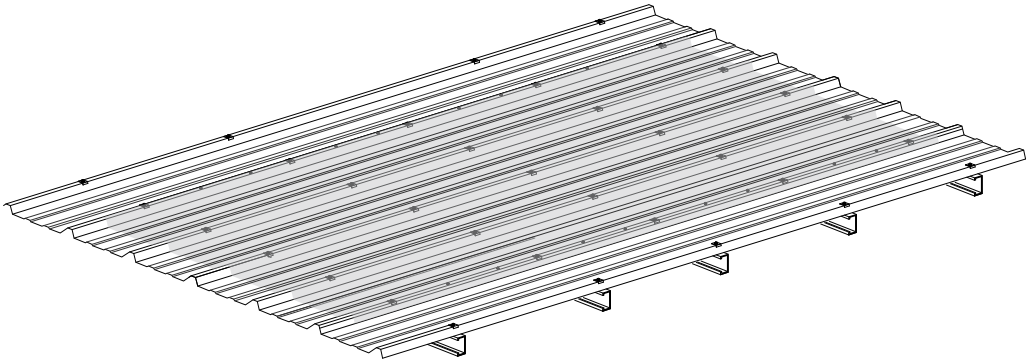
Side-lights should be installed with Polycarbonate UV protected on both sides.

Polycarbonate rooflights should not come in contact with plasticizers.

Barrier tape (manufacturer-approved) should be used to prevent direct contact with plastisolcoatings on metal sheets.

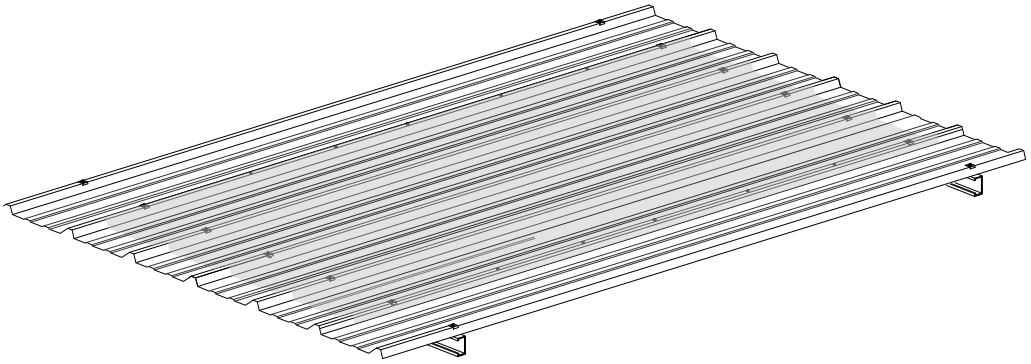
Multi-span Rooflight

SUNTUF panel that cover two spans or more, supported by at least 3 purlins supported by at least 3 purlins.



Single-span Rooflight

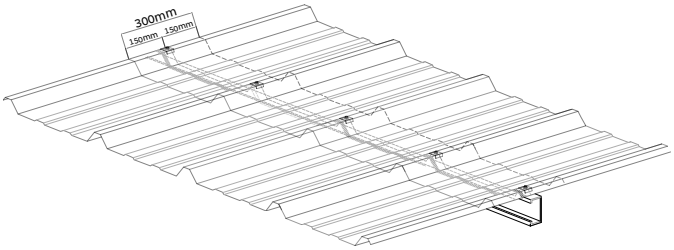
SUNTUF panel that covers one span, supported by 2 purlins. Overlapped top and bottom by the roof cover panels.



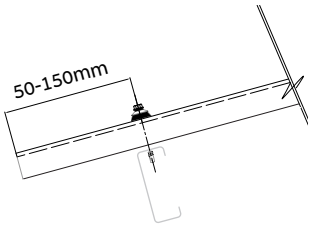
Overlaps

Recommended longitude overlap of 200mm to 300mm above purlin.

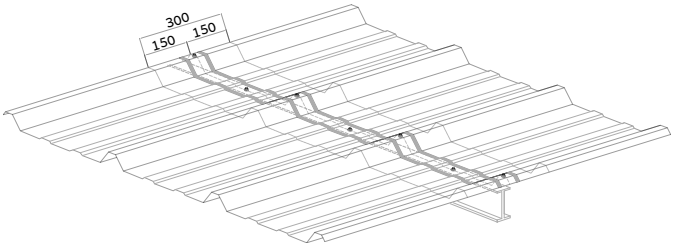
Each panel to extend 100mm to 150mm over the fixing line along the purlin.



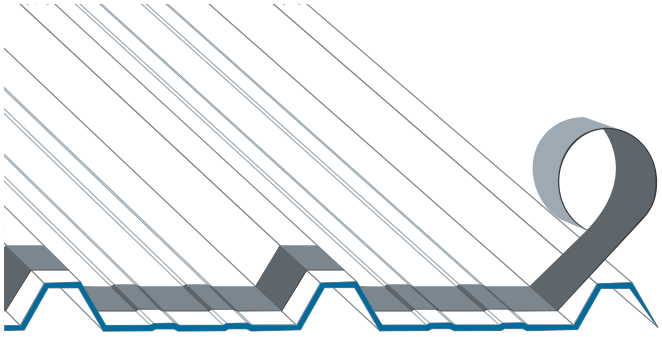
Panels should overhang Min. 50mm and Max 150mm beyond the last fixings line.



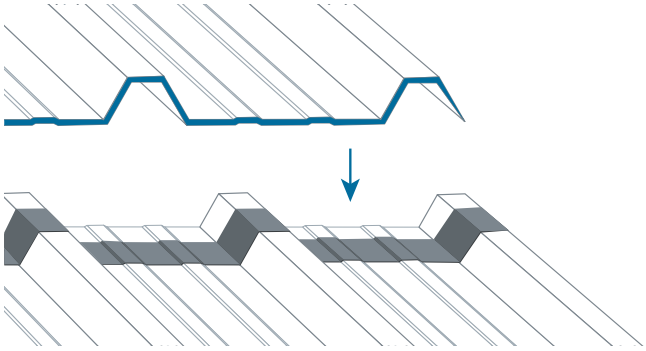
For best leak proof apply two runs of butyl sealing tape on both sides of fasteners line.



Use butyl sealing tape for sealing the overlaps. The strip should be placed between overlapping panels along the length and width of the overlap at both edges.



Apply butyl sealing tape along the bottom and top end-lap (if there is), along screws centerline or two tapes on both sides of screw centerline.



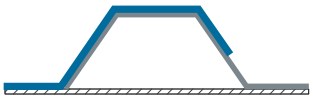
Side-laps

For best leak proof performance apply butyl sealing tape between the panels, along the overlaping corrugation.

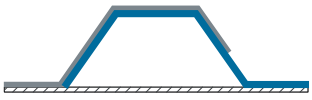
SUNTUF side under-lap must be supported.

For secure side-lap, it is recommended to apply stitching screws along the side lap every 300-400mm.

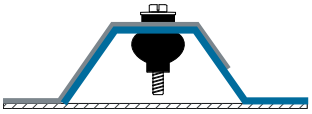
Side lap—SUNTUF over metal



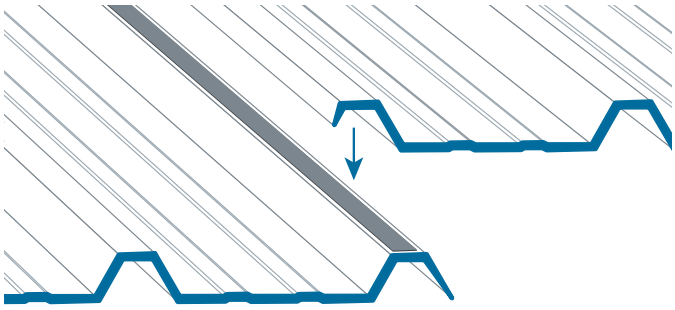
Side lap—metal over SUNTUF



Side lap—metal over SUNTUF

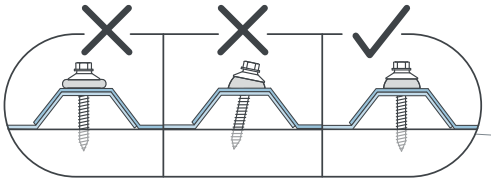


One run of butyl sealing tape between and along the panels. The butyl sealing tape cannot supersede the fasteners in overlaps tightening. Sheet to sheet tightening by stitching screw is essential.

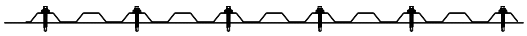


Fastening

- Pre-drill 10mm holes at screw points.
- Start fastening the screws at the lower purlin from the first side-lap through the pre-drilled holes.
- Fasten screws on every purlin from the lower end towards the upper end sequentially, starting always from the same side.
- The charts below describe the fasteners setting along the purlin for various profile types.
- Do not over-tighten!
- Fasten stitching screws along the side-laps at every 300-400mm.

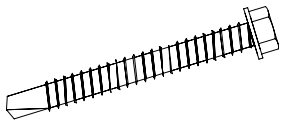
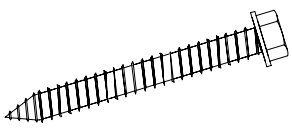
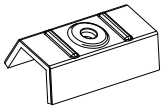


Fasteners location chart

Pitch of corrugation	Fasteners location	
	Middle purlin	End purlin
> 200 mm	 Every corrugation	 Every corrugation
100 to 200 mm	 Every 2 corrugations	 Every corrugation
Up to 100 mm	 Every 3 corrugations	 Every 2 corrugations

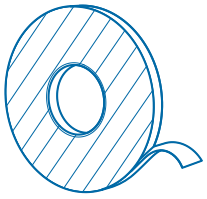
Accessories

Fasteners - Metal screws should be long enough to protrude at least 15mm into the metal purlin (not including the thickness of the metal). Wood screws should be long enough to penetrate at least 25mm (1") into the wooden purlin.

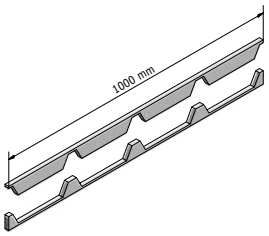
Item	Illustration	Length mm (inch)		Item No.
Self-drilling screw		25	1"	92049
		32	1.25"	92050
		38	1.5"	96966
		51	2"	97374
		64	2.5"	92051
		76	3"	92052
		89	3.5"	92053
Self-tapping screw		25	1"	92021
		32	1.25"	92019
		38	1.5"	96922
		51	2"	97341
		64	2.5"	92044
		76	3"	92045
		89	3.5"	92046
19 mm Washer/Gasket				92063
25 mm Washer/Gasket				92024
Storm Washers		Standard aluminum or galvanized metal crest rider with EPDM or foam polyethylene gasket, sized to fit onto the corrugation crests.		

Sealing strips

Overlaps sealing: Butyl sealing tape,
6mm (wide) X 4mm (thick).



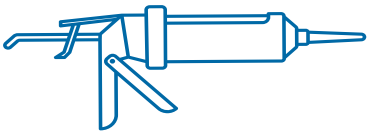
Closure strip: shaped closure strip can be used wherever sealing between the SUNTUF panel and the edge purlin of the roof is needed (usually at ridge-to-gutter rooflight application). The end closure is made of polyethylene foam (XPE) strip, shaped to fit the panel. The strip is held in place, between panel and purlin, by the fasteners.



Compatible Adhesives & Sealants

The majority of widely available adhesives and sealants for roofing are NOT compatible to SUNTUF.

PALRAM offers compatibility tests with SUNTUF for any sealing material.



Maintenance

SUNTUF panels do not require special maintenance or treatment.

For cleaning use water pressure cleaner and allow natural drying.

Chemical Resistance of Palram Polycarbonate Products

The table in the following pages lists the resistance of polycarbonate sheets to a number of commonly encountered chemicals and other corrosive media at room temperature (Information on chemical resistance at higher temperatures will be supplied upon request). Where the chemical resistance varies with concentration, the results of tests at different concentrations is presented. It serves as a basis for recommendation. PALRAM does not guarantee chemical resistance, unless specific tests are carried and separate documentation is supplied.

For chemicals and corrosive media not mentioned in the list, please contact your Palram representative, which will place you in contact with the Palram's R&D & Technology Department.

Chemical resistance abbreviations in the table:

R - Resistant | **LR** - Limited Resistance (gradual attack over time may occur) | **N** - Not Resistant (rapid attack or attack over short time period will occur

Chemical Resistance of Polycarbonate Products at Room Temperature

Chemical	Concentration	Resistance
Acetaldehyde		N
Acetic Acid	10%	R
Acetic Acid	25 (concentrated)	LR (N)
Acetone		N
Acetylene		R
Acrylonitrile		N
Ajax Detergent		R
Allspice		N
Allyl Alcohol		LR
Alum (Aluminum Ammonsium Sulfate)		R
Aluminum Chloride	Saturated	R
Aluminum Oxalate		R
Aluminum Sulfate	Saturated	R
Ammonia (Gas)		N
Ammonia (Aqueous)		N
Ammonium Carbonate		LR
Ammonium Chloride		R
Ammonium Fluoride		N
Ammonium Hydroxide		N
Ammonium Nitrate		R
Ammonium Sulfate	Saturated	R
Ammonium Sulfide		N
Amyl Acetate		N
Amyl Alcohol		LR
Aniline		N
Antimony Trichloride	Saturated	R
Aqua Regia (3 parts HCl:1 part HNO3)		LR
Arsenic Acid	20%	R
Automatic Switch Grease		R
Automotive Waxes		LR
Baby Lotion		R
Bacon Fat		R
Barium Chloride		R
Battery Acid		R
Beer		R
Beet Syrup		R
Benzaldehyde		N
Benzene		N
Benzoic Acid		N

Chemical	Concentration	Resistance
Benzyl Alcohol		N
Betadine		R
Bleach (Clorox)		R
Blood and Blood Plasma		R
Borax		R
Boric Acid		R
Brake Fluid		N
Bromine		N
Bromobenzene		N
Butane		R
Butter		R
Butyl Acetate		N
Butyl Alcohol (Butanol)		R
Butylene Glycol		R
Butyric Acid		N
Calcium Chloride	Saturated	R
Calcium Hypochlorite		R
Calcium Nitrate		R
Calcium Soap Fat		R
Camphor Oil		N
Carbolic Acid		N
Carbon Bisulfite		N
Carbon Dioxide Gas (Moist)		R
Carbon Disulfide		N
Carbon Monoxide		R
Carbon Tetrachloride		N
Castor Oil		R
Catsup (Ketchup)		R
Caustic Potash (Potassium Hydroxide)		N
Caustic Soda (Sodium Hydroxide)		N
Chlorine Gas (Dry)		LR
Chlorine Gas (Wet)		N
Chlorobenzene		N
Chloroform		N
Chocolate		R
Chrome Alum	Saturated	R
Chromic Acid	20%	R
Cinnamon		R
Citric Acid	10%	R

Chemical	Concentration	Resistance
Cloves		N
Coal Gas		R
Coca Cola		LR
Cocoa		LR
Cod Liver Oil		R
Coffee		LR
Cooking Oil		R
Copper Sulfate	Saturated	R
Cresol		N
Cupric Chloride	Saturated	R
Cuprous Chloride	Saturated	R
Cyclohexane		R
Cyclohexanol		LR
Cyclohexanone		N
DDT		R
Dekalin		R
Detergent (most)		LR or R
Developing Solutions		N or LR
Diamyl Phthalate		N
Diesel Fuel		R
Diethyl Ether (Ethyl Ether)		N
Dimethyl Formaldehyde (DMF)		N
Dimethyl Sulfoxide (DMSO)		N
Dinonyl Phthalate (plasticizer)		LR
Doctyl Phthalate (plasticizer)		LR
Dioxane		N
Diphyl 5,3		LR
Ethanol (Ethyl Alcohol) and Water	96	R
Ethanol (Ethyl Alcohol)	Pure	LR
Ethyl Amine		N
Ethyl Acetate		N
Ethyl Bromide		N
Ethylene Chloride		N
Ethylene Chlorohydrin		N
Ethylene Dichloride		N
Ethylene Glycol (Antifreeze)		LR
Ferric Chloride	Saturated	R
Ferrous Sulfate		R
Fish and Fish Oils		R
Floor Polish		R
Formalin	10%	R
Formic Acid	10% (30%)	R (LR)
Freon TF		R
Freon (all others)		N
Fruit Juices and Pulp		R
Gasoline		N
Gear Oil		R
Glazers Putty		R
Glucose		R
Glycerine		R
Glycerol		R

Chemical	Concentration	Resistance
Glycols		R
Glutaraldehyde	50%	R
Grease, Automotive (Most)		R
Heptane		R
Hexane		R
Hydrazine		N
Hydrochloric Acid	20 (Concentrated)	R (N)
Hydrofluoric Acid	20%	R
Hydrogen Peroxide	30%	R
Hydrogen Sulfide		R
Iodine (aqueous solution)	5%	R
Iodine		N
Inks (Most)		R
Isoamyl Alcohol		LR
Isopropyl Alcohol		R
Kerosene		R
Lactic Acid	20%	R
Lacquers and Thinners		R
Laundry Detergents (Most)		R
Ligroin (Hydrocarbon Mixture)		R
Lime Solution (2%) or paste		R
Liquors or Liqueurs		R
Linseed Oil		R
Loctite		R
Lubricating Oils (Most)		R
Machine Oils (Most)		R
Magnesium Chloride	Saturated	R
Magnesium Sulfate	Saturated	R
Manganese Sulfate	Saturated	R
Margarine		R
Mayonnaise		R
Meat		R
Mercuric Chloride	Saturated	N
Mercury		N
Methane		R
Methanol (Methyl Alcohol)	Pure	LR
Methylamine		R
Methylcellusolve		N
Methylene Chloride		N
Methyl Ethyl Keton (MEK)		N
Methylmethacrylate		N
Milk		N
Mineral Oil		R
Motor Oils (Most)		R
Mustard		R
Naphtha (Stanisol)		R
Nickel Sulfate		N
Nitric Acid	20%	R
Nitrobenzene		R
Nitropropane		R
Nitrous Oxide		R
Nutmeg		N

Chemical	Concentration	Resistance
Oleic Acid		N
Onions		R
Oxalic Acid	10%	R
Oxygen		R
Ozone		R
Paprika		R
Paraffin		R
Pentane		LR
Pepper		LR
Perchloric Acid	10 (concentrated)	N
Perchloroethylene		R
Petroleum		LR
Petroleum Ether		LR
Petroleum Oil (Refined)		R
Phenol		N
Phosphoric Acid	10%	R
Phosphorous Oxychloride		R
Phosphorous Pentoxide	25%	LR
Phosphorous Trichloride		N
Polyethylene		R
Polyethylene Glycol		R
Potassium Acetate		LR
Potassium Aluminum Alum (Sulfate)	Saturated	R
Potassium Bichromate		R
Potassium Bromate		R
Potassium Bromide		R
Potassium Chloride	Saturated	R
Potassium Cyanide		N
Potassium Dichromate	Saturated	R
Potassium Hydroxide		N
Potassium Metabisulfite	4%	R
Potassium Nitrate	Saturated	R
Potassium Perchlorate	10%	R
Potassium Permanganate	10%	R
Potassium Persulfate	10%	R
Potassium Rhodanide	Saturated	R
Potassium Sulfate	Saturated	R
Propane		R
Propargyl Alcohol		R
Propionic Acid	20%	R
Propionic Acid	Concentrated	N
Propyl Alcohol (1-Propanol)		R
Pyridine		N
Salad Oil		R
Salt		R
Silicofluoric Acid	30%	R
Silicone Grease		R
Silicone Oil		R
Silver Nitrate		R
Soap (Ivory)		R
Sodium Bicarbonate	Saturated	R
Sodium Bisulfate	Saturated	R
Sodium Bisulfite	Saturated	R

Chemical	Concentration	Resistance
Sodium Carbonate	Saturated	R
Sodium Chlorate		R
Sodium Chloride	Saturated	R
Sodium Chromate		R
Sodium Hydroxide		N
Sodium Hypochlorite	5% Chlorine	R
Sodium Nitrate		N
Sodium Sulfate	Saturated	R
Sodium Sulfide		N
Sodium Thiosulfate		R
Spindle Oil		R
Stannous Chloride		R
Starch		R
Styrene		N
Sugar	Saturated	R
Sulfur Dioxide (Gas)		R
Sulfuric Acid	<50 (50<70)	R (LR)
Sulfurous Acid	10%	N
Sulfuryl Chloride		N
Tapping Oil		R
Tartaric Acid	30%	R
Tear Gas (Chloracetophenone)		LR
Terpineol		N
Tetrahydrofuran		N
Tetralin		N
Thiophene		N
Thyme		R
Titanium Tetrachloride		R
Tobacco		R
Toluene		N
Transformer Oils		R
Transmisssion Fluid		R
Trichloroacetic Acid	20%	LR
Tricholorethylamine		N
Trichloroethylene		N
Trichloroethylphosphate		LR
Tricresylphosphite		N
Trisodium Phosphate		R
Turpentine		LR
Urea		R
Vacuum Pump Oil		R
Vanilla		R
Vanillin		R
Varnish		N
Vaseline		R
Vegetable Juices		R
Vegetable Oils		R
Vinegar		R
Water (Demineralized or Sea)		R
White Spirit		N
Wine, Whiskey, Vodka, Rum, Cognac		R
Witch Hazel		R

Chemical	Concentration	Resistance
Worcester Sauce		R
Xylene		N
Zinc Chloride		R

Chemical	Concentration	Resistance
Zinc Oxide		R
Zinc Stearate		R
Zinc Sulfate		R

Entries indicate the following: R - resistant, LR - limited resistance, N - not resistant
*concentration of aquesous solution except where noted
"Entries indicate the following: R - resistant,. LR - limited resistance, N- not resistant"
*concentration of aque?ous solution except where noted.
The chemical resistance information in this table is based on our research and experience and may be considered solely as a basis for recommendation, but not as a guarantee, unless specifically furnished as such by PALRAM

SUNTUF - Solar Transmission Properties per Color

Product	%LT*	%HAZE*	%LR	%ST	%SR	%SA	%SRt	%STt**	%SC
Clear	90	<5	3	86	3	11	11	89	1.0
Clear Embossed	90	5 to 10	9	87	8	5	12	89	1.0
White Opal 30%	30	100	54	31	48	21	63	37	0.42
White Opal 35%	35	100	59	36	51	13	61	39	0.45
White Opal 40%	40	100	54	38	47	15	58	42	0.49
White Opal 45%	45	100	48	44	41	15	52	48	0.56
White Diffused 85%	85	100	16	77	13	10	20	80	0.92
Grey 20%	20	5 to 10	4	27	4	69	54	46	0.53
Grey 35%	35	5 to 10	3	43	2	55	43	57	0.66
Solar Control 20%	20	70 to 75	29	19	29	52	67	33	0.38
Solar Control 50%	50	35 to 40	25	46	25	29	46	54	0.62
Solar Ice 25%	25	100	53	27	46	27	65	35	0.40
Bronze 25%	25	5 to 10	7	32	7	61	51	49	0.56
Bronze 35%	35	5 to 10	3	41	3	56	44	56	0.64
Bronze 50%	50	5 to 10	4	53	4	43	35	65	0.74
Smooth Cream 30%	30	100	55	50	50	0	50	50	0.58
Misty Green 20%	20	100	25	31	26	43	57	43	0.50
Green 45%	45	<5	7	66	9	25	27	73	0.84
Blue 35%	35	<5	7	69	8	24	25	75	0.87
Grey 20%	20	25 to 30	11	20	11	69	62	38	0.44
Solar control 20%	20	75	30	16	29	55	69	31	0.36
Solar Ice 20%	20	100	53	22	48	30	69	31	0.35

Valid for thickness of 0.8mm to 2.0mm.
According to ASTM E424-71.
* according to ASTM D-1003.
** STt is the percentage expression of solar heat gain coefficient (SHGC).
Definitions for the terms used in the above table appear in the next page.

Definision for Solar Transmission Properties Table

Visible Light Radiation - The portion of the light spectrum whose wavelength ranges from 400 nm to 700 nm.

% Light Transmission (%LT) - Percentage of incident visible light that passes through an object.

% Light Reflection (%LR) - Percentage of incident visible light that strikes an object and returns as visible light.

% Light Absorption (%LA) - Percentage of incident visible light that strikes an object and is absorbed by it.

%LT + %LR + %LA = 100%

Solar Radiation - The solar spectrum ranging from 300 nm to 2400 nm. Included are UV, visible and NIR radiation.

% Direct Solar Transmission (%ST) - Percentage of incident solar radiation that passes directly through an object.

% Solar Reflection (%SR) - Percentage of incident solar radiation that strikes an object and is reflected.

% Solar Absorption (%SA) - Percentage of incident solar radiation that strikes an object and is absorbed by it.

%ST + %SR + %SA = 100%

Total Solar Transmission (%STt)* - The percent of incident solar radiation transmitted by an object which includes the direct solar transmission plus the part of the solar absorption reradiated inward.

Total Solar Reflection (%SRt) - The percent of incident solar radiation reflected by an object, which includes the solar reflectance plus the part of the solar absorption, reradiated outward.

%STt + %SRt = 100%

Shading Coefficient (SC) - The ratio of the total solar radiation transmitted by a given material to that transmitted by normal glass, whose light transmission is 87%.

It can be approximately calculated by:

SC = 1.15 x (%ST + (0.27 x %SA)) / 100

%ST + (0.27 x %SA) = %STt

SC = 1.15 x STt /100

Physical Properties Table

SUNTUF corrugated polycarbonate sheet possesses electrical, mechanical, physical, optical and thermal properties, presented in the table below, that provide comprehensive solutions for a wide variety of applications. The combination of these characteristics qualifies SUNTUF sheets as a first class material.

Property	Method*	Conditions	Units - SI	Value
Physical				
Density	D-1505		g/cm3	1.2
Water Absorption	D-570	24 hr. @ 23°C	%	0.15
Mechanical				
Tensile strength at yield	D-638	10 mm/min	MPa	62
Tensile strength at break	D-638	10 mm/min	MPa	65
Elongation at yield	D-638	10 mm/min	%	6
Elongation at break	D-638	10 mm/min	%	>70
Tensile Modulus of Elasticity	D-638	10 mm/min	MPa	2,300
Flexural Modulus	D-790	1.3 mm/min	MPa	1,890
Flexural Strength at Yield	D-790	1.3 mm/min	MPa	93
Notched Impact Strength Izod	D-256	23°C (73°F)	J/m	800
Notched Impact Strength Charpy	D-256	23°C (73°F)	J/m	800
Impact Falling Weight	ISO-6603/1b		J	50
Rockwell Hardness	D-785		R scale	118
Thermal				
Long Term Service Temperature			°C	-50 to +100
Short Term Service Temperature			°C	-50 to +120
Heat Deflection Temperature	D-648	Load: 1.82 MPa	°C	135
Vicat Softening Temperature	D-1525	Load: 1 kg	°C	150
Coefficient of Linear Thermal Expansion	D-696		10-5 cm/m °C	6.5
Thermal Conductivity	C-177		W/m K	0.21
Specific Heat Capacity	C-351		kJ/kg°K	1.3
Optical				
Haze	D-1003		%	<0.5
Light Transmission	D-1003		%	90
Refractive Index	D-542			1.57
Yellowness Index	D-1925			<1
Electrical				
Dielectric Constant	D-150	1 KHz		2.6
	D-150	1 MHz		2.4
Dissipation Factor	D-150	1 KHz		0.005
	D-150	1 MHz		0.02
Dielectric Strength Short Time	D-149	500 V/s	kV/mm	20
Surface Resistance	D-257	Ketley	Ohm	4.1x1015
Volume Resistance	D-257	Ketley	Ohm-cm	1.7x1017

* ASTM method except where noted otherwise

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