PS Datasheet

Sheet Properties

- Excellent dimensional stability to heat
- High rigidity
- Hardness
- Good mechanical characteristics
- Extraordinary dielectric values, making them excellent electrical insulators that can be used from low to high frequencies.
- Low volatile substance content
- Termite and micro-organism resistant
- High brightness level 90% visible spectrum (400 – 800 nm) light transmission, with light absorption rapidly increasing in the ultraviolet band
- There no sharp variations in properties at low temperatures
- Low water absorption tendency
- They are suitable for use with food FDA (21 CFR 177.1315), United States (except the UV version).
- They comply with European EN 71 standard for toy safety.

Applications:

- Food and non-food packaging
- Parts for household electrical goods
- Consumer electronics
- Household items
- Bath and shower screens
- Painting, poster and photo frames
- Glazing
- Showcases
- Lamps and ceiling lights

Dimensional stability to heat

PS sheets can be briefly exposed to temperatures of 80ºC without deformation or contraction. Prolonged exposure must not exceed 80 to 85ºC.

Stress cracking

- As a consequence of a combination of pressure or stress and chemical attack, fissures may appear over time in function of the stress intensity, the chemical agent and sheet thickness.
- Stress cracking in the case of bathroom screens, for example: stress: pressure produced by the aluminium profile on the sheet.
- Chemical agents: There may be three types:
    - External lubricants: Products employed to facilitate the insertion of the sheet into the profile, such as Vaseline, oil or silicone etc.
    - Aluminium cleaning agents. Degreasing agents employed to clean the aluminium once the screen has been assembled.
    - PVC seal additives. Plastifying agents derived from pthalic acid that are used to provide the PVC with ductility; this plastifying agent migrates to the surface and attacks the PS.
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Recommendations for preventing the formation of cracking:

- The sheet must not be subjected to any excessive pressure in the joint.
- Clean cutting of the PS sheets.
- Lubricants should not be employed to insert the sheets and great care should be taken in cleaning the aluminium after assembly to employ a product that does not affect the sheet.
- Correct choice of sealing product

The following are recommended:

- Polyethylene + ethyl acetate (PE + EVA) seal
- Silicon rubber seal
- Hot bead or fill-in of neutral silicone

The following are not recommended:

PVC seal, especially with plastifying agent deriving from pthalic acid.
Better results are achieved using polymer plastifying agents.

Ageing

PS sheets are stabilised against ageing that can be produced by the oxygen in the air and high temperatures (up to a maximum of 80ºC). On premises where there are normal temperature and illumination conditions, the PS sheets maintain their appearance and service qualities for many years.
Under outside weather conditions, deterioration is produced by the UV component of sunlight that directly strikes them, for which reason they are not recommended for prolonged use outside. Ageing shows up as progressive yellowing and the loss of surface brightness, together with a reduction in sheet mechanical properties.

TRANSPORT:

- Dirt and sharp angles may damage the surface in the case of friction.
- During transport, stable, flat pallets should always be used and the sheets secured to prevent sliding.
- The sheets must not be allowed to slide over each other during loading and unloading operations.
- They should be lifted by hand without any dragging or by suction-cup lifting equipment.

STORAGE:

- An incorrect storage position can lead to permanent deformation.
- The sheets should be stored in closed premises that guarantee normal environmental conditions.
- The sheets should be stored one on top of the other on flat horizontal surfaces and fully supported over their total area.
- The topmost panel should be covered with a sheet of polyethylene or cardboard etc.
- PS sheets must not be stored in direct sunlight or under conditions of high humidity and/or temperature as this can have a negative effect on protective film adhesion

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Material Characteristics

	METHOD	UNITS	VALUE
PHYSICAL			
Density	ISO 1183	$g.cm^{-3}$	1,08
MECHANICAL			
Tensile Strength @ Yield	ISO 527	Mpa	*
Tensile Strength @ Break	ISO 527	Mpa	67
Elongation @ Break	ISO 527	%	2,5
Tensile Modulus of Elasticity	ISO 527	Mpa	3700
Flexural Strength	ISO 178	Mpa	97
Charpy Notched Impact Strength	ISO 179	$kJ.m^{-2}$	1,28
Charpy Unnotched	ISO 179	$kJ.m^{-2}$	17
Rockwell Hardness M / R scale			83/(*)
Ball Indentation	ISO 2039	Mpa	165
OPTICAL			
Light Transmission		%	65
Refractive Index			1,561
THERMAL			
Max. service temperature		ºC	85
Vicat Softening Point - 10N	ISO 306	ºC	108
Vicat Softening Point - 50N	ISO 306	ºC	105
HDT A @ 1.8 Mpa	ISO 75-1,2	ºC	98
HDT B @ 0.45 Mpa	ISO 75-1,2	ºC	101
Coefficient of Linear Thermal Expansion x10-5		$x10_{-5}$. $ºC_{-1}$	7

(*) not applicable

CHEMICAL RESISTANCE	BEHAVIOUR		
	GOOD	LIMITED	POOR
Mineral Oil (*)	X		
Vegetable Oil (*)	X		
Acetone (*)			X
Acetic Acid (*)		X	
Water	X		
Turpentine (*)			X
Ammonia	X		
Detergents (*)	X		
Ethanol (*)		X	
Petrol (*)	X		

CHEMICAL RESISTANCE	BEHAVIOUR		
	GOOD	LIMITED	POOR
Glycerine	X		
Methanol		X	
Toluene (*)			X

(*)Test conditions: Total immersion during 1 year at a temperature of 23°.

FIRE PERFORMANCE

COUNTRY	STANDARD	CLASSIFICATION
GERMANY	DIN 4102-1	B2
FRANCE	NPF 92-507	M4