

## Properties

### Dimensional stability to heat

The upper temperature limit for SANuv sheet usage is 85°C.

Higher temperatures can be withstood only briefly. This indication is only valid when the heating medium is air. Heat transmission is considerably higher in water and other liquids and deformation may appear at lower temperatures. Parts that are subjected to frequent, sharp temperature modifications may develop minute capillary cracking that become enlarged over time. In this respect, SANuv sheets are considerably more stable than those of other polymers.

### Cracking under pressure

The appearance of cracking essentially depends on the joint action of a chemical agent, temperature, applied stress and the time during which these are applied. The acrylonitrile content in SAN copolymer has a positive action on resistance to cracking under stress.

### Ageing

The UV component of sunlight causes degradation to all plastics in general.

This degradation depends on the exposure conditions, in other words, on the actual duration of exposure to sunlight, the sheet inclination to the sun's rays, temperature and humidity and on this same sunlight intensity (geographical coordinates).

This degradation shows up as a progressive yellowing, a reduction in light transmission and loss of mechanical properties.

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The ultraviolet additives in SANuv sheets enhance its behaviour to light and conserve its properties without any great changes during years of exposure to outside weather conditions. When used in exterior applications, the protective film must be removed immediately, since exposure to sunlight can cause permanent adhesion to the sheet.

STANDARD SPECIFICATIONS FOR PETG RESIN			
	CODE	UNIT	VALUE
PHYSICAL			
Density	ISO 1183	g / cm <sup>-3</sup>	1.08
MECHANICAL			
Tensile strength @ yield	ISO 527	MPa	(*)
Tensile strength @ breakage	ISO 527	MPa	67
Elongation @ breakage	ISO 527	%	2.5
Tensile modulus of Elasticity	ISO 527	MPa	3700

Flexural strength	ISO 178	MPa	97
Charpy impact strength notched	ISO 179	kJ / m <sup>2</sup>	1.28
Charpy impact strength un-notched	ISO 179	kJ / m <sup>2</sup>	17
Rockwell hardness, M / R scale			83/(*)
Ball pressure hardness	ISO 2039	MPa	165
<b>THERMAL</b>			
Maximum Service temperature		°C	85
VICAT Softening temperature (10 N)	ISO 306	°C	108
VICAT Softening temperature (50 N)	ISO 306	°C	105
Heat deflection temperature, HDT A (1.8 MPa)	ISO 75-2	°C	98
Heat deflection temperature HDT B (0.45 MPa)	ISO 75-2	°C	101
Coefficient of linear thermal expansion	ISO 75-2	x10 <sup>-5</sup> / C	7

<b>OPTICAL</b>			
Light transmission	ASTM D-1003	%	86
Refractive index	ASTM D-542		1.561

These data correspond to raw material values.

(\*)Non-applicable

<b>CHEMICAL RESISTANCE</b>			
CHEMICAL PRODUCT	BEHAVIOUR		
	SATISFACTORY	REGULAR	UNSATISFACTORY
Mineral oil	X		
Vegetable oil	X		
Acetone			X
Acetic acid		X	
Water	X		
Turpentine			X
Ammonia	X		
Detergents	X		
Ethanol		X	
Petrol	X		
Glycerine	X		
Methanol		X	
Toluene			X

PETg safety file is available for any additional type of query.

## Handling

### Cleaning

Use a neutral detergent (pH7) and water (any type of window cleanser will mark the sheet). To do so, always clean and dry with a soft cloth applying very little pressure.

### Cutting

#### Important!

Do not remove the protective film from the sheets before cutting, and once this has been accomplished blowing or suction should be employed to eliminate any chips.

#### Manual cutting

Manual saw cutting should always be carried out with a fine-blade saw, with the sheet firmly held in place to prevent vibration. The teeth should be well-sharpened.

#### Cutting with a blade

When cutting with a blade, this should be passed several times in order to achieve the desired depth (this should be a minimum of half the thickness), employing a uniform pressure. The sheet must be firmly secured to prevent sliding. Afterwards, the sheet should be placed on a flat surface and gentle pressure applied until it breaks. Sandpaper may be employed to eliminate any burrs.

#### Electric sawing

##### Cutting recommendations for SANuv sheets

- Disc diameter: 350 - 400 mm
- Number of teeth: 84 - 106
- Rotation speed: 2,800 - 4,500 rpm
- Advance speed: 12 - 18 m/min

#### Type of teeth

Alternate teeth or combined straight and trapezoid. The sheet must be firmly secured to prevent it rising up and causing cracks when the disc passes. The translation speed should be as uniform as possible. The disc must be regularly sharpened.

### Polishing

Pre polishing may be required to eliminate any marking caused by the cutting disc.

#### The following may be used:

- Rotating rigid fabric discs with polishing paste.
- Rotating soft fabric discs with polishing for the final finish.

### Drilling

Metal and wood drill bits may be employed.

The larger the diameter, the lower the speed.

Water or air can be used for cooling.

A hole diameter that is approximately 1.5 times that of the screw to be used should be drilled in order to prevent sheet dilation.

The sheet must be firmly secured to prevent breaking.

A sharp object can be employed to start the hole.

## Handling

### Gluing

#### Solvents

Various solvents may be employed in gluing. The most common is MEK (methyl-ethyl-ketone). In general, aromatic solvents applied with a syringe or fine paintbrush can be used. Other possible solvents are acetone and styrene. It is recommended that 5% of SAN be dissolved in these products to thicken the mixture. Before carrying out the actual gluing operation the surfaces to be glued must be cleaned with alcohol.

#### Glues

These are solvent-free adhesives, with two components based on polyurethanes. They are transparent, odour-free and do not attack the plastic. They permit different type of plastic to be joined together and also plastics to other materials, such as glass, aluminium and steel etc.

#### Welding

SANuv sheets may be welded together using ultrasound or heat pulses. The welding quality will increase when the distance between the sonotrodes is decreased. High frequency welding is not possible because the material has low dielectric losses.

### Thermoforming

SANuv sheets are easily thermoformable in any oven with air circulation. The sheet temperature must exceed 120 C. If the sheets have been stored in a damp environment, it is preferable for them to be previously dried for a few hours (two to four) at an approximate temperature of between 80 to 85 C in order to avoid thermoforming problems. To achieve a good finish, the mould employed can also be heated to between 50 and 60 C. An excessive mould temperature could harm the sheets.

*All NUDEC products use film to protect the surface from possible damage during production and transport. This protective film is not prepared to withstand high temperatures and must be removed prior to thermoforming or hot-bending.*

### Bending

The sheet should be locally heated with an electrical element and then quickly bent. It is a good idea to cool the part of the sheet that is closest to the bending line. When bending thick sheets, it is recommended that both sides are heated, with the sheet being firmly secured after bending in order to maintain the exact position. We recommend that the smallest radius be twice the sheet thickness.

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## Handling

### Cleaning

The sheet surface must be clean and free from grease, demoulding agents and any other contamination. Degreasing can be performed using a 50/50 mixture of isopropanol and isobutanol. NUDEC®SANuv sheets are easily printed, lacquered and painted using a wide range of products. Many coverings recommended for acrylic sheets are also suitable for NUDEC®SANuv sheets. It should be ensured that the NUDEC®SANuv sheet will not be attacked by solvents incorporated in the lacquers or varnishes and paint manufacturers should be consulted about products designed to cover SAN.

### Vacuum metallisation

NUDEC®SANuv sheets can be vacuum metallised. It must be stressed that the obtained finish will depend of the surface shine of the sheet before this process is carried out. The print film should be removed just prior to printing to prevent the surface from damage.

### Responsibility clause

- Supplies its products in accordance with the indications prepared by the purchaser with respect to the ordered material and quality. In this sense, NUDEC, S. A. provides its customers with all available professional and technical information deriving from its product analyses.
- Once the material has been delivered by NUDEC, S. A., the purchaser is fully responsible for all subsequent application, treatment, use and/or utilisation of this same material, whether by the actual purchaser or by third parties.
- The purchaser is wholly and solely responsible for carrying all tests or analyses, of any nature, which are required to verify that the product can be effectively applied for the purpose sought by the purchaser or by any third parties to whom the purchaser supplies the product or for whom it is installed.
- NUDEC, S. A. is exempt from any responsibility deriving from any inadequate or defective application of its products by the purchaser or subsequent third parties, and only accepts damages deriving directly from possible defects of its products at origin.

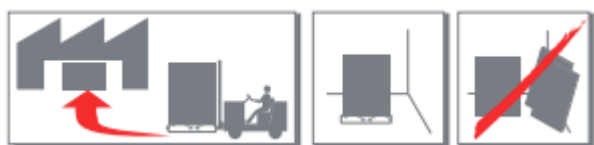
## Handling



### 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.
- NUDEC®PETg sheets must not be stored in direct sunlight or under conditions of high humidity and/or temperature as this can have a negative effect of protective film adhesion.