PRODUCT DATA

INTASTOP PVC SHEET (1/3)

PVC blends have been developed to produce light weight, tough, flame retardant sheet materials for cladding or thermoforming. Available in an extensive range of colours and finishes these materials are easy to clean and resistant to staining, providing a beautiful finish that lasts.

PRODUCT AVAILABILITY

PRODUCT	INTASTOP PVC SHEET
Gauge mm	0.8 – 3.2
Length mm	350 – 5000
Width mm	350 – 1500

TEXTURES

Smooth
Leatherette
Pebblette
Deeper Leatherette
(other textures available)

COLOUR RANGE

MANUFACTURING TOLERANCES

SHEET GAUGE	Up to 1.00mm	1.00 to 3.00mm	3.00 to 3.20mm
GAUGE	+/- 0.05mm	+/- 0.10mm	+/- 0.15mm
LENGTH	+/- 5.00mm	+/- 5.00mm	+/- 5.00mm
WIDTH	+/- 3.00mm	+/- 3.00mm	+/- 3.00mm

CHEMICAL RESISTANCE AT ROOM TEMPERATURE

REAGENT	CHEMICAL RESISTANCE
Acetone	N
Acid – Inorganic (Weak)	G
Acid – Inorganic (Strong)	G
Acid – Organic (Weak)	G
Acid – Organic (Strong)	G
Alcohol	G
Antifreeze	E
Base (Weak)	E
Base (Strong)	E
Battery Acid	G
Brake Fluid	P
Coffee	E
Detergent	E
Diesel	G
Foodstuffs	G
Lubricating Oil	E
Petrol	G

KEY
E - Excellent
G - Good
F - Fair
P - Poor
N – Not Recommended
S - Solvent

It is important to note that the resistance of PVC sheet against the substances mentioned should only be used as a guideline since chemical resistance is influenced by such factors as concentration, temperature exposure time and stress.

PHYSICAL PROPERTIES

	Test Method	Unit	Intastop Sheet
Density*	ISO1183	g/cm^3	140
Izod Impact Strength (+23^{o}c)	ISO180	KJ/m^2	11
Tensile Strength	ISO527	Mpa	35
Vicat Softening Point	ISO306A	^{o}c	75
Heat Deflection Temperature	ISO75A	^{o}c	60
Flammability Rating	UL94	1.20mm	V-0#
Co-efficient of Linear Thermal Expansion	DIN 53752	10^{-5}mm/ mm/^{o}c	6
Mould Shrinkage	Internal	%	0.6 – 0.8

* Density varies with pigmentation level
\# Flammability is based on raw material data at 1.00mm

ADDITIONAL FLAMMABILITY INFORMATION

TEST METHOD	RESULT
BS476 PART 7	Class 0

Intastop Ltd, Holly House, Holly Street,
Kelham Road Industrial Estate, Doncaster, DN1 3QZ
T. 01302 364666 F. 01302 364777 E. sales@intastop.com

PRODUCT DATA

INTASTOP PVC SHEET (2/3)

CLEANING AND MAINTENANCE

Most common soaps or detergents dissolved in warm water can be used to effectively clean general dirt and surface contaminants from thermoplastic materials. More stubborn solvent based markings i.e. ink, marker pen etc. can be removed using detergents but will probably require the use of a stiff bristled brush or slightly abrasive pad to remove stains or marking if material is effected deep in the surface emboss.

1. Any marks that cannot be removed using soap or detergent can be removed using iso-propyl-alcohol or n-heptane.
2. Abrasive scouring powders should be avoided but proprietary household cleaners are effective cleaning agents.
3. Areas of mouldings that have been dulled through cleaning can be restored using silicone based polishes.

THERMOFORMING

During thermoforming the use of a heated steel or aluminium mould is strongly advised.
The higher the mould temperature, the better the quality and detail of moulding.

For best thermoforming results:

1. A mould draft angle of 4-6° is required to allow proper part release.
2. Allow for post mould shrinkage of 0.6-0.8%.
3. Moulding radii should be at least the same magnitude as residual wall thickness.

PROCESSING INFORMATION

PRE-DRYING
It is advisable that sheet containing ABS is dried before thermoforming if it has been stored for long periods in a humid atmosphere. It is recommended that the sheet be dried at approximately 80°C in a hot air circulating oven. The sheet drying time depends on the sheet thickness and the following table can be used as a guide.

Thickness (mm)	Drying Time at 80°c (hours)
1	1.0 – 1.5
2	2.5 – 3.0
3	3.5 – 4.5
4	5.0 – 6.0
5	6.0 – 7.5
6	7.5 – 9.0
7	8.5 – 10.5
8	10.0 – 12.0
9	11.0 – 13.5
10	12.5 – 15.0

It is essential that enough space is left between the sheets (20-30mm) to allow correct drying. The time lapse between drying and forming should be minimised in order to save energy and reduce heating times. If sheets are left to stand at room temperature for any length of time, they may need to be redried.

HEATING

PVC sheet should be heated using a controlled and uniform thermal cycle at between 140-170°C.
PVC materials start to thermally degrade at temperatures over 160°C. Protracted exposure to high temperatures should be avoided as it leads to colour degradation and loss of physical properties.
The sheets are best heated using double sided heaters to ensure fast and uniform heating. The required heating cycle should be established using pre-production trial samples. This heating cycle is directly proportional to the wall thickness. Matt sheet finishes are normally best retained by applying the majority of the heat through the lower heater onto the back of the sheet.
The core of the thermoplastic sheet being thermoformed must be heated uniformly to its forming temperature. The rate of heating must be controlled in order to avoid degradation and burning of the sheet surface.
Matrix heating can be used, but all zones must be set to ensure that the coolest zones are at least at the melt softening temperature of the material being formed. If the sheet is not uniformly heated, then the resultant residual stresses can cause part warpage, lower impact resistance and other similarly undesirable effects

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PRODUCT DATA

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COOLING

To ensure consistency of parts throughout production runs, it is recommended that the thermoforming tooling used is temperature controlled. Ideally aluminium moulds containing cast-in cooling tubes should be used. The implications on cost and quality can be disastrous if sufficient attention is not paid to such parameters. Proper mould temperatures should be determined and maintained throughout runs. Generally, higher mould temperatures result in lower part shrinkage. Additionally, in conjunction with fast application of vacuum, fewer residual stresses are left in the part. The rate of cooling of the thermoformed part is critical to obtaining a good quality part and effective production. As soon as the heated sheet makes contact with the temperature controlled tool, the cooling process starts. Generally it is only possible to impart temperature control from the tooling side of the part. The rate of cooling can be further controlled by using ambient air or water sprays to reduce the part temperature below the heat distortion temperature and allow ejection.

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