PALCLEAR® / PALOPAQUE®

Flat Solid PVC Sheet

Fabrication Guide



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General Recommendations for Working With PALCLEAR and PALOPAQUE

Handling & Storage

- The PALCLEAR and PALOPAQUE family of products is intended for interior use only, and not to be subjected to direct or indirect UV exposure.
- Flat solid PVC sheets should be transported and stored horizontally, on a flat, sturdy pallet whose dimensions are equal or larger than the largest of the sheets. The sheets should be secured to the pallet during transportation and on site handling. It is recommended to stack the sheets with the longer sheets at the bottom and the shorter on top, leaving no unsupported overhang.
- When moving a pallet with a forklift, always use forks as long as the sheets' width. Shorter forks used on a wider pallet may cause damage to the sheets.
- The sheets leave the factory in packages, wrapped in white, watertight polyethylene. The wrapping should be removed as close to the actual time of installation (or use) as possible. Storage of the sheets should be in a covered, dry, ventilated place, away from direct sunlight and rain.
- Avoid extended exposure to direct sunlight, which may cause excessive heat buildup. Long term heating may lead to softening of the protective polyethylene masking, fusing it to the sheet's face and making removal difficult or even impossible.
- Avoid leaving the sheets stored unwrapped. Dirt may accumulate on the sheets and/or their edges, attracted by electrostatic charges in the sheets, necessitating extra time and labor for cleaning before installation.
- Whenever necessary to store the pallet in the open, cover it with white opaque polyethylene sheet, cardboard or any other insulating material, taking care to cover the stack completely.

Mechanical Fastening

Flat solid PVC sheets can be fastened with nuts and bolts, providing that several points be kept in mind:

- Never use rivets, as they apply excessive force and could cause cracks in the sheets.
- Always drill a slightly over-sized hole by 2-3 mm to compensate for thermal expansion.
- Use EPDM and aluminum washers to distribute the load.
- When using mechanical fasteners, they should be evenly spaced to avoid stress accumulation at particular points.
- With nuts and bolts, tighten moderately.
- Wherever possible, a "frame installation" is preferable, similar to glass, and without mechanical drilled fasteners.

Treatment of Sheets after Installation

The sheet's polyethylene masking must be removed after it is installed. The masking covers the sheet to protect it during handling, storage, and installation, but once the sheet is installed — it must be removed within 24 hours of installation.

Flat solid PVC sheets may be cleaned by carefully following the instructions on page 8.

General Fabrication Guidelines

Tools

Flat solid PVC sheets can be fabricated with standard power or hand tools for wood or metal, as long as they are well sharpened and have the clearance required for machining rigid plastics. Only speed regulated tools should be used. Utilize the highest possible speed that will not melt the sheet during processing, due to heat buildup.

High-Speed steel tools are adequate in most cases. Carbide tipped tools are preferred for continuous production lines. Tools should be set up so just the cutting edges should come into actual contact with the fabricated material, to reduce frictional heat buildup.

Cooling

Cooling is not required under standard machining conditions.

When high-speed machining is necessary, clean water, cooling fluids or compressed air can be used to cool the material and tool, and remove the machining chips.

Size Regulation

Due to the thermal expansion of Flat solid PVC, which is considerably greater than that of metals, glass or concrete, precision measurement checks should always be done at a fixed reference ambient temperature.

Protective Film (Masking)

The Flat solid PVC polyethylene (PE) protective masking may be left on the sheet during most regular fabrication, to prevent damage to the surface.

Fabrication Markings

When necessary, mark sheets to be fabricated on the protective masking. If, for some reason, it is necessary to mark directly on the sheet, use wax pencils or felt tipped marking pens.

Marking the exposed surface by scratch marks with sharp objects may initiate fractures and induce failure under load.

Sawing & Cutting

A variety of power saws, either table mounted or portable can be used to saw Flat solid PVC. Shearing or punching are also possible on sheets less than 2mm in thickness.

Table Mounted or Portable Circular Saws

These types of saw are widely used to saw Flat solid PVC. There are two major workshop types and one portable type:

- A Moving Table, Fixed Blade Bench Saw: is preferable for long, straight sawing.
- Radial Arm Saw: is generally used for "cross-cut" (width) or diagonal sawing.
- Portable Circular Saw: usually restricted for use on site for straight cutting, is slower and not as accurate as table saws. This type of saw may be attached underneath a special bench to function as an on-site, limited operation fixed table saw.

Circular Saw Blades

Should be fine toothed hollow ground, or preferably carbide tipped, triple chipped or alternate bevels (Alt 1 and Alt 2, see figures 1a & 1b below, respectively), with minimal blade body contact with the cut material. Such blades can offer clean, good quality cuts.

Generally Accepted Recommendations for Circular Blade Specifications

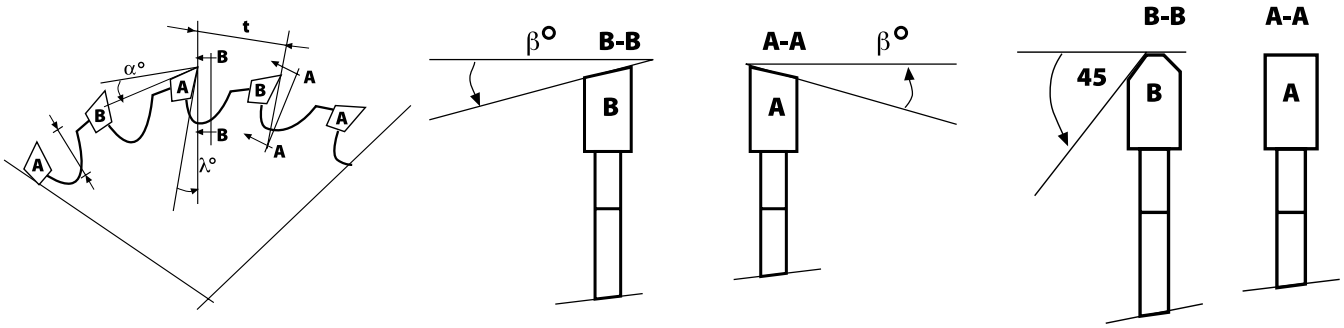
Property	Units	Sign	Value
Clearance angle		α	10 – 20°
Rake angle		γ	5 – 15°
Alternate double-bevel angle (Alt. 1)		α°	45°
Alternate bevel angle (Alt. 2)		β°	10 – 15°
Cutting speed -	m/min. (ft/min)		1.000 - 3.000 (3.300 - 10.000)
Rate of feed	mm/sec. (inch/sec.)		30 (11/4)
Thin gauge: 1.5-2.5 mm tooth pitch (1/16" - 3/36")	Teeth per mm (Teeth per inch)	t	2,5 - 6 (10 - 12)

Notes: For sawing thin gauge sheets of less than 2 mm thickness, It is recommended to batch together 10 - 15 such sheets, with a thicker (3-4 mm) bottom sheet for support.

Palram Detailed Circular Saw Cutting Recommendations

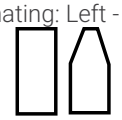
These recommendations are based on technical experience, particular tests and vast practical experience. These recommendations are to be accepted only as general guidelines.

Figure 1	Figure 1a	Figure 1b
Typical Circular Saw Blade (segment)	ALT1 - Alternate Teeth Configuration	ALT2 - Alternate Teeth Configuration



Notes: Teeth shapes sketches are not to scale. They should be considered to serve only as an indication.

Circular Saw Blade Specifications for Cutting Flat solid PVC sheets

Property	Value	
	[mm]	[in.]
Clearance angle	350	14
No. of teeth in blade	108	
Thickness	2,2 - 3.2	3/32" - 1/8"
Teeth angles	Rake: 10° Clearance: 15°	
Tooth appearance	Alternating: Left - Right 	
Speed	1800 - 2400	

Note: Teeth shapes sketches are not to scale. They should be considered to serve only as an indication.

Band Saw

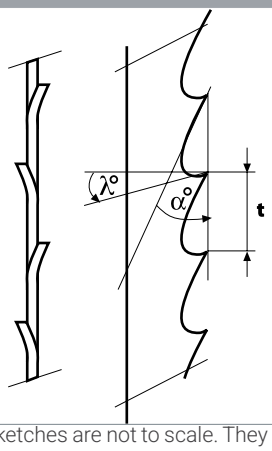
Band saws can be used for cutting Flat solid PVC sheets of most thicknesses with acceptable results. Band saws are workshop tools.

In Flat solid PVC fabrication, they are mostly used to cut formed parts or irregular shapes. It is possible to cut flat sheets in straight lines too, but in limited length and width, due to the tool's limitations.

- The preferred band saw blade should have slightly set teeth, with 10 - 20 mm blade widths similar to those blades used for metal cutting.

Figure 2

Typical Band Saw Blade Configuration



Note: Teeth shapes sketches are not to scale. They should be considered to serve only as an indication.

Recommended Band Saw blade Properties

Property	Sign	Units	Units
Clearance angle	α		10 – 20°
Rake angle	γ		5 – 15°
Cutting speed		m/min (ft/min)	1.000 - 6.000 (1.950 - 3.300)
Rate of feed		mm/sec (inch/sec)	20 (13/6)
Thin gauge: 1.5-2.5 mm tooth pitch (1/16" - 3/36")	t	Teeth per mm (Teeth per in.)	1,5 - 2,0 (12 - 18)

Notes:
1. A band saw is suitable for cutting curved lines and 3-dimensional, formed parts.
2. For cutting a few formed objects of the same shape, they must be firmly clamped together.
3. A band saw cutting usually yields rougher finished edge, which must be smoothed by sanding and polishing. A belt sander is a preferred tool for such an operation.
4. For better finished edges, use a circular saw.

Jigsaw or Saber Saw

Band saws can be used for cutting Flat solid PVC sheets of most thicknesses with acceptable results. Band saws are Portable saws of these types use short movement, reciprocating blades, instead of one-direction orientation, continuous movement blades like those of circular or band saws, and are much slower in operation.

- **Chipping:** Various sized chips are broken off on both edges of the saw line, leaving the cut edges rough and uneven.
- **Gumming:** Chips and splinters from the advancing saw blade overheat during the sawing process, melt and create a mass of cooled down material in front of the blade. The swarf sticks to the edges, leaving an unsightly, rough edge finish, which is difficult to clean.

Jigsaw or saber saw cutting usually results in an inferior finish of the cut edges. Palram recommends sanding and polishing of the cut edges as standard practice. A belt sander is the preferred tool for such an operation.

Gummed material may also stick to the blade itself and cause the blade to seize up.

Sawing Tips:

- Cut with protective film on sheet to reduce any damage to sheet during cutting process..
- Choose the correct tooth size and pitch.
- Select an appropriate saw speed.
- Lower the feed rate as the sheet approaches the blade to avoid gumming or chipping of the sheet.
- Examine the sharpness of the blade.
- Examine the blade alignment.
- Sheets must be firmly clamped to a sturdy based prior to cutting.
- When sawing sheets 2mm or thinner, stack 5-10 sheets together and clamp firmly to a sturdy base prior to cutting.
- To reduce vibration of sheet, insert cardboard under sheet during sawing process.
- Cool the blade with compressed air when long cuts are required.
- Take frequent pauses during long production runs, to let the saw blade cool down.
- Begin sawing with the blade already running at the full recommended speed.

Routing

A versatile technique, enabling diversity of edge fabrications and trimming of Flat solid PVC sheets, notably for parts too large or of irregular shape for a band saw.

- The feed rate should be slow, to avoid excessive heat buildup.
- As a safety measure, when routing, always guide the sheet with a suitable jig.
- A jet of compressed air can be used to cool the bit and the sheet at the spot of cutting and assist in chip removal.

Static bench routers: Fast, strong and stable, for complex and accurate straight-line fabrications.

Portable routers: Less powerful, for smaller or on site jobs. Also used for trimming and edge fabrications of irregular shapes. Can perform certain small milling jobs like butt shaping on rectangular or round apertures or tongue and groove butt finish on thicker sheets.

Tooling

Recommended Router Bit Properties

Property	Units	Value
Clearance angle		5 - 10°
Rake angle		0 - 10°
Router speed - w/o load	rpm	18,000
Feed rate	mm/min.	2500 - 6000

Routing and milling tips: For clean, smooth routing work ensure cutter's sharpness and accurate alignment before starting work.

Milling & Joining

A portable router, with suitable cutters, can be used for small milling jobs.

A standard woodworking jointer-planer, preferably with carbide or high-speed blades/cutters, can be used for trimming, resulting in a good quality edge finish.

Avoid excessive stock removal, which may result in shattering or rough edges. A cut of 0.4 mm (0.016 in.) or less per pass is recommended.

Finishing Recommendations for Sawing and Cutting

Unintended saw marks, rough or jagged corners, or uneven, drawn edges created by imperfect shearing may result in crazing and cracking, that can develop further to failure under load.

Palram recommends finishing the edges of cut Flat solid PVC sheets to a smooth appearance.

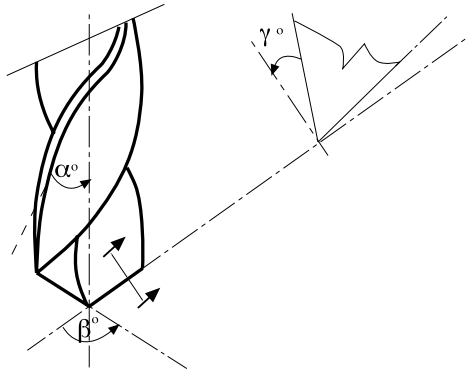
This will ensure that no cracks will develop from the irregularities at the edges.

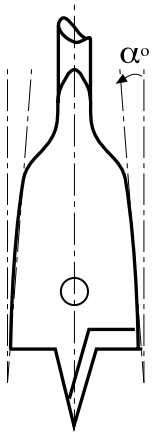
Drilling

General Indications

Drill bits: Regular, new high-speed steel twist drills, (Fig. 3a) or new carbide-tipped drills are suitable for drilling holes in Flat solid PVC sheets of various thicknesses, as long as they are sharpened well. They are used mainly for bores up to 12 mm diameter.

Figure 3a	Figure 3b
Regular Drill Bit	Flat Chisel Edged Drill Blade





Larger holes may be drilled by flat, chisel edged drill blades with a triangular cutting tip, (Fig. 3b) similar to those used in woodworking, kept sharp. Rake angle should be about 5° to avoid side friction. They are used mainly for bores from 1/2" to 13/16" (12 to 20 mm).

Commercially available hole saws or circle cutters of several types can be used for performing large round apertures.

Speed: Decrease the drill's speed as hole diameter and / or sheet thickness gets larger. Drilling speed may vary due to actual conditions.

Feed rate: May vary due to actual conditions.

Drilling Speed and Feed Rate Change in Accordance with Bore Diameter

Hole Diameter			Drill Speed	Feed Rate	
[mm]	[In.1]	[In.2]	[rpm]	[mm/rev]	[in./rev]
3	1/8	0,12	1500 - 1800	0,03 - 0,07	0,012 - 0,028
6	1/4	0,24	800 - 1500	0,03 - 0,07	0,012 - 0,028
10	13/32	0,4	500 - 1000	0,01 - 0,07	0,004 - 0,028
15	19/32	0,6	350 - 700	0,07	0,028
20	25/32	0,8	250 - 350	0,07	0,028

Recommended Drill Bit Configurations

Property	Sign	Units	Value
Clearance angle			10 – 20°
Rake angle	γ°		0 – 10°
Drill tip angle	β°		110 – 150°
Helix angle	α°		30°
Cutting velocity		m/min. (ft./min.)	15 - 30 (49 - 98)

* Notes: For small gauge sheets (1 - 2 mm or 0.04 - 0.08 in.) we recommend using flatter tip drill bits (β = 140 - 150°) for achieving a cleaner bore with less risk of chipping.

Drilling tips and recommendations

- **Location:** Locate holes no closer to the edges than 2 – 2.5 times the diameter of the pertinent hole, with a 10mm (0.4 inch) minimum.
- **Precision:** It is imperative to keep the sheet (or stack of sheets) firmly clamped to a stable workbench (or a similar base) to avoid fluttering during drilling.
- **Cooling:** Usually cooling is not required with regular drills. However, in cases of deep drilling, like putting perpendicular holes through the sheet's edge, or when drilling through a stack of sheets, cooling both the drill bit and the vicinity of the hole with a jet of compressed air is a good practice. It is also recommended, when drilling deep holes, to stop frequently, pull the drill out and clear the hole from swarf and debris with compressed air.
- **Preventing internal stresses:** Producing a clean, smooth bore, keeping heat buildup to the minimum, by the procedure described above, prevents excessive heat buildup, meltdown and gumming of the drilling dust and debris, and possible seizure of the bit. It also prevents undue internal stresses at the vicinity of the hole.
- Honing and polishing the edge of the hole by mechanical or chemical means contributes to keeping the sheet stress-free, preventing cracking.
- **Maintaining the edge:** Carbide tipped twist drill bits are preferable for long or continuous production runs. They are more durable and improve the edge quality.

Grinding & Polishing

Practical objective: Rough, uneven, untended edges may be starting points for crazing and/or cracks after the Flat solid PVC sheet is installed and subjected to day by day exposure to incidental loads or impacts.

A belt sander, equipped with a 400 - 500 grit belt, running at 20 - 30 m/sec, is the preferred option, applying low contact pressure during operation. Wet sanding and waterproof belts are preferable, as they prevent heat buildup, sanding dust accumulation, and prolong sanding belt life.

A reciprocating or orbital sander can also be used, but it can be applied only by the dry sanding method. Manual Sanding can also be used, wet or dry, working with successive grit size abrasive paper (Starting with 100, then 280-grit silicon-carbide, and finally 400 - 600 grit sandpaper).

Cleaning

General Cleaning Instructions for Flat solid PVC

The Palram PVC products can be easily cleaned utilizing a soft sponge or cloth made from 100% cotton, lukewarm water and a mild dish washing detergent. All surfaces should then be rinsed with cold water and dried with a soft cotton cloth to reduce water spotting. In some instances this procedure may be inadequate and require the use of additional cleaning agents. The agents listed below have all been approved for use at room temperature.

Cleaners Suitable for Use on Flat solid PVC:

Chemical Cleaners:

- Methyl alcohol
- Ethyl alcohol
- Butyl alcohol
- Isopropyl alcohol
- Heptane
- Hexane
- Petroleum ether (BP 65°)
- VM&P Naphtha

Biodegradeable Cleaners:

- Brillianize - Plastic Cleaner
- Klear to Sea

General PVC Cleaning Guidelines:

- Never use abrasive or high alkaline cleaners on PVC sheets.
- Do not use cleaners on PVC sheets for an extended period of time. Rinse immediately with clean, cold water.
- Do not apply cleaners in direct sunlight.
- Never use sharp objects, wipers (squeegees) or razors on PVC sheets.
- Do not clean with gasoline.
- Always practice safety first and never step directly on PVC sheets.
- Always test cleaners in a small inconspicuous area prior to cleaning entire panel to prevent adverse results.
- When using a pressure washer, do not allow the spray tip to come too close to the panel, as it could have enough pressure to penetrate or tear the panel.
- Avoid dry cleaning, as sand and dust particles clinging to the exterior of the panels may scratch the surface.

Disinfect / Sanitize PVC Guidelines

Isopropyl Alcohol

Alcohol solutions (isopropyl alcohol / purified water) or wipes with at least 70 percent alcohol are effective for sanitization of most hard surfaces. First, clean the surface with soap and water. Apply the alcohol solution and let it sit on the surface for at least 30 seconds to disinfect. Wipe dry with a clean cloth.

Hydrogen Peroxide

Household (3 percent) hydrogen peroxide is effective in deactivating most viruses within 6 to 8 minutes of exposure. Pour it undiluted into a spray bottle and spray it on the surface to be cleaned, but let it sit on the surface for 8 minutes and wipe dry with a clean cloth.

Cold Forming

Cold Curving

- Flat solid PVC sheets can be cold bent or curved, within their minimal permitted bending radius, without damaging their mechanical performance. The minimal permitted bending radius for a Flat solid PVC sheet is a factor of their thickness and should be calculated in the following manner: 200 x sheet thickness (e.g. for a 5 mm PALCLEAR or PALOPAQUE sheet, 5 x 200 = 1000 mm minimum cold bending radius). Moreover, based on our experience and observations, the internal stresses induced by curving give them extra strength and rigidity in both directions.
- Rigidity and support spans increase progressively as the curve radius is reduced (down to the minimal permitted radius). A shallow curve should be considered virtually the same as a flat panel, while a deep curve may add significantly to the bridging ability.

Thermoforming

Guidelines for the Heating Process

- Good quality thermoformed products can only be achieved through a careful and controlled heating process. All parts of the treated sheet should reach even, uniform temperature, achieved by a slow, controlled heating rate, avoiding sudden changes in air circulation and temperature. Such events may result in hot spots and possible distortions. Sheet edges must maintain the same forming temperature as the whole sheet.
- Pre-heating of the clamping frame from 50˚C-60˚C is recommended.
- **Temperature Regulation:** Continuous regulation of the sheet's temperature must be maintained inside the thermoforming device itself. PALCLEAR or PALOPAQUE sheet (of any type) tends to cool quite quickly, and may need a regulating system for adding or dispersing of excess heat on the spot. The sheet's temperature at the thermoforming zone (or the whole sheet) should be kept between 95˚C-105˚C during the forming process. Forcing the sheet to form at a lower temperature may induce detrimental internal stresses, reducing the sheet's impact resistance and increasing its chemical sensitivity. Internal stresses are invisible and can be detected only by polarized light. Annealing may reduce the stresses, although it is a complicated process and could be inefficient or impossible to perform in most cases.
- **Protective Polyethylene (PE) masking in Thermoforming:** The PE masking can be left on the sheet during thermoforming

Hot-Line Bending

General Guidelines

- **Description:** A simple bending technique, used for forming local, straight line, one axis bent parts (such as corners, boxes, and machine guards).
- **The process:** A bending device with localized heaters on one or two sides of the sheet to be bent is used.
- **Ventilation:** When heat forming flat solid PVC sheets the process must be performed in a highly ventilated area. Ventilation hoods over the process would be the suggested method of ventilation.

Steps & Indications

General Guidelines

- One-sided heating method may suffice for sheets up to 3 mm. Thicker sheets or more demanding cases require using twosided heating. Keeping control of the sheet's temperature limits of 95˚C-105˚C is of the utmost importance.
- Forcing the bend at lower temperatures will render the sheet fragile at the bend. Experimenting with small samples before final execution is highly recommended.

PE Masking: Peel off the masking on both sides of the sheet along the bend line about 100 mm on each side. It is possible to process the sheet with the masking on, up to 5 mm thickness. For sheets of 6 mm thickness or more the PE masking should be removed along the bending line, as described above. Always test a few samples before proceeding to production.

Heaters: Linear IR (Infrared) or resistance wires strip heating elements are used, preferably with heat reflectors. The width of the heated zone depends on the number of elements used, the spacing between them depends on their specific thermal output and the distance from the target sheet.

Bending process: When the sheet has reached the required temperature, the heaters are to be switched off. The sheet, held in pivoted clamps, preferably equipped with a caliper, is then bent to the required angle, secured there until it cools down and sets.

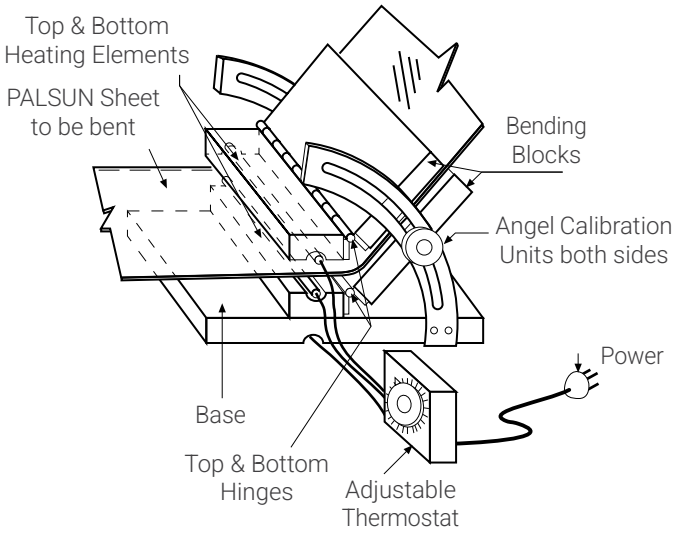
Note: It is recommended to perform the bend a few degrees tighter than the required angle, as the angle may increase as the sheet cools. The desired angle may be reached after a few trials.

Cooling is to be done in ambient air, taking care to avoid sudden drafts. This can cause distortion of the final product.

The minimum hot-line bending radius is three times the thickness of the bent sheet. Larger radii can be achieved by widening the heated zone.

Figure 4

Heat bending device



Forming - Notes for Consideration

Localized heating and cooling expansion/contraction characteristics are unpredictable in many cases. Short elements (up to 1.00 m usually remain flat. Longer elements may distort to a concave shape (the outer edges are longer than the line-bent side due to uneven contraction).

This phenomenon can be corrected or reduced by simple jigs or frames, which hold the part in the right position during the cooling period. It is always advised to fabricate experimental test samples to check feasibility of the bending operation.

Thermoforming Tips

- Consistent part-to-part uniformity is better ensured if the sheet blanks prepared for the thermoforming process are always cut from the sheet in the same orientation.
- Best results in thermoforming are achieved when parts are heated to temperatures just above the HDT 65 °C.
- Secure the cooling area for thermoformed parts against undue drafts. Uneven cooling may result in warping and/or curling of parts.
- Assure precise and systematic control over oven temperature and heating time.

The Molds

Can be made of many materials including steel, aluminum, wood, ceramic, glass, etc., as long as it can withstand the temperature inside the oven without visible distortion. The upper surface is usually covered by heat resistant felt, which will not mar the exterior sheet surface facing the mold face.

Vacuum Forming

General Guidelines

Vacuum forming is the most versatile and widely used thermoforming process. The equipment required is simpler and less costly to operate than most pressure or mechanical thermoforming techniques. Good results are quite easily attained with standard vacuum forming equipment.

Reduction in Thickness: The Vacuum forming procedure generally stretches parts of the processed sheet to smaller thickness at varied areas (according to the system chosen). Always take this into consideration when choosing the primary sheet thickness.

General Vacuum Forming Heating Guidelines:

Sheet Temperature During Forming: 95˚C-105˚C

Mold Preheat Temperature: 50˚C - 60˚C

Sheet Temperature for Removal from Mold: < 30˚C

Printing

Flat solid PVC are suitable for all printing methods which are applicable to rigid sheets.

Direct Digital Printing

Wide format and flatbed printers use various ink and ink curing technologies to allow high quality printing at relatively high speeds. High quality digital printing depends on various factors:

- Printer capabilities
- Ink technology and quality
- Type of printing substrate and quality
- Machine operator experience level

Flat solid PVC are suitable for use with UV curing and solvent-based digital inks, and for IR drying when water-based inks are used. It will retain its clarity or tint, even after intense UV curing.

Protective Film Masking

The protective polyethylene film masking helps prevent surface abrasion and stains. However, removing the protective film may cause an increase of static electric charge, which can affect ink coverage. Therefore, after peeling the film away from the sheet, the static electricity that has built up in the sheet should be discharged using an ionized gun or a suitable device provided by the printer manufacturer.

Cleaning in Preparation for Printing

The surface should be clean before printing. Carefully inspect each panel to ensure there is no: dust, fingerprints, residue or other foreign substances that may affect ink coverage or adhesion. If needed, the sheets should be cleaned with a damp rag, or with isopropyl alcohol.

Ink Adhesion

Flat solid PVC are suitable for all types of inks: aqueous, solvent based, and UV curable. This suitability is affirmed by major printer OEM's, including HP, AGFA, Canon, EFI, Mutoh, and more. For compatibility information and recommendations, please consult the printer manual or contact the printer manufacturer.

Ink Drying

There are two main technologies used for ink drying in digital printing:

IR (Infrared) – When drying inks using IR heat, drying temperatures must remain under 62˚C

Flat solid PVC are suitable for UV curing.

Print Head Adjustment

The distance between the print head and the substrate can have a significant affect on print quality. Manufacturer specifications, combined with operator experience, should determine print head distance from the substrate.

The suggested starting distance should not be more than 2 mm from the print head to the substrate.

Adhesives and Sealants

Adhesives and sealants are a special class of substances often required during installation or fabrication of Flat solid PVC. The guidelines for their use, appearing below, must be followed.

- Use only sealants, adhesives, rubber packing, sealing strips & gaskets that are compatible with Flat solid PVC and approved by Palram. An updated list of compatible adhesives and sealants can be found in the "Recommended Adhesives and Sealants for Palram PVC Products" below. EPDM rubber sealing strips and gaskets are the preferred choice, (though the use of neoprene is permitted) due to a longer life expectancy and durability.
- Use of sealants, adhesives and other sealing products not included in the recommended list "Recommended Adhesives & Sealants for Palram PVC Products" must receive the Manufacturer's explicit approval.
- Use of materials that are not on the list, and/or which have not received the Manufacturer's explicit approval, may harm the sheets and void all warranties and any responsibility of the Manufacturer for the performance of Flat solid PVC.

Adhesives

Product	Manufacturer	Material Type
TANGIT for PVC-U (rigid)	Henkel	Solvent mixture
PVC Kit	Bison	Solvent mixture
700, 702, 704, 705, 710, 711, 717, 719, 1001, 1007, 1784, 1909, 1910, 2007	IPS Weld-on	Solvent mixture
Acrifix A-117	Rohm	Solvent mixture
Acrifix A-190	Rohm	Solvent mixture
HE 1908	Engineering Chemicals	2 component PU
3054	Loctite	Cyanoakrylate
MA3940, MA3940LH	Itw Plexus	2 component methacrylate
Black Max 380	Loctite	Cyanoakrylate
Super Bonder 414	Loctite	Cyanoakrylate
Depend 330	Loctite	Two part / Acrylic
3105	Loctite	Light Cure Acrylic
EVO-PLAS PLUSBOND 3019	Evode	Solvents & PVC
EVO-PLAS EVO-STIK 613	Evode	Polymer/Polychloroprene
EVO-PLAS EVO-TECH TU 1908	Evode	Polymer/Polyurethane

Silicone Sealants

Product	Manufacturer	Material Type
Multisil	GE Bayer Silicones	Sealant
Silglaze N	GE Bayer Silicones	Sealant
Silpruf	GE Bayer Silicones	Sealant
UltraGlaze	GE Bayer Silicones	Sealant
Novasil S-64	Otto Chemie	Sealant
Sikaflex 11FC	Sika	Sealant
Q3-3793	Dow Corning	Sealant
Q3-7098	Dow Corning	Sealant
Q3-7099	Dow Corning	Sealant
791-P	Dow Corning	Sealant
Plastisil BSR 50-02	Simson Professional	Sealant
Tremasil 100	Tremco	Sealant

Adhesive Tape

Product	Manufacturer	Material Type
IDL 311 L	Sellotape	Butyl rubber sealant
A 311	Sellotape	Butyl rubber sealant
Pressure sensitive 5313	3M	Acrylic double stick
4830	3M	Acrylic double stick
VHB 4945	3M	Acrylic double stic
Duplomont 918	Lohmann	-

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