

Vacuum Thermoforming of Avery Dennison® 5500 QM and Avery Dennison® 5600 LD Translucent Film

Introduction

This bulletin describes the preparation and use of Avery Dennison 5600 LD Translucent Film and Avery Dennison 5500 QM Translucent Film applied on rigid substrates and processed in vacuum thermoforming equipment. The film application can be performed utilizing wet or dry methods with a roll laminator.

Preparation

Cleaning

All surfaces must be considered contaminated and must be cleaned prior to the film application. Prepare the substrate according to instructions given in Avery Dennison Technical Bulletin 1.1

Substrate

Application can be done on several types of substrates, like on polycarbonate and acrylic sheets. The preparation of the rigid sheets must be done properly and in accordance with the recommended procedures of the sheet manufacturer. Please consult the manufacturer's instructions

Pre-drying

Pre-drying procedures vary with the chemical nature of the rigid sheet and its thickness. Please refer to the manufacturer's instructions for further details on the handling procedures, health and safety procedures and other precautions to be taken during the processing of the sheet.

Film Application

Wet method

If the wet method is used to apply the Avery Denison 5600 LD and 5500 QM Translucent Film, re-drying must be performed after each layer of the film has been applied. Generally, each re-drying period takes about 2 hours at 80° C or 1 to 2 days in an environment with a temperature between 20° to 23°C.

Dry method

If the dry application method is applied in a laminator, allow the laminate to dwell for 4 hours to permit the adhesive to flow out, prior to thermoforming.

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Vacuum thermoforming

Both male and female molds can be used in the thermoforming process. Use for first surface decorations the male mold and for second surface applications the female mold. Be aware that the film becomes thinner as it is shaped during the forming process, therefore the depth of the draw should be kept to a minimum. It is recommended that test faces be produced to confirm the performance of the film with the specific forming equipment.

Pre-heating of the rigid sheet with the film applied just before the forming process may improve production efficiency.

The forming process temperature should not exceed 190° C and the forming process period should not exceed 10 minutes.

It is advisable to check on the surface temperature periodically during the process with heat sensitive thermo-labels or other thermo devices to ensure the film is not being overheated.

The use of double-sided heaters may make the process more stable since individual temperatures settings can be controlled.

Cutting / weeding

Careful handling of the formed faces is required since the laminate will remain at elevated temperatures for some time. Cutting and weeding should be completed as soon as the temperature has reached the level, which permits handling of the face.

The film cutting may be done with conventional graphic knives, using clean and sharp blades. Avoid over-cutting of letters and graphics to eliminate or reduce the risk of light leaks. For optimum weeding results, carefully remove the excess film at an angle of 110° to 160° with short and jerky movements. The angle range at which the excess can be removed is to minimize possible adhesive transfer. Slightly warming up the laminate may also reduce the possibility of adhesive transfer.

Important notices

- Testing of the thermoforming capabilities of the used equipment is recommended.
- Test faces should be produced to confirm that the film, together with the rigid media, suits the specific thermoforming equipment and working procedures.
- Before the start of any project or production run, the converter needs to be assured that the final test face is in accordance with their customer expectations.

References

- Technical Bulletin 1.1: Cleaning and preparation of application substrates
- Technical Bulletin 1.4: Application methods for Avery Dennison self-adhesive films
- Technical Bulletin 3.1: Signcutting of Avery Dennison films