

Technical Brief

KYDEX®
 THERMOPLASTIC SHEET

KYDEX® FST with Microban® Antimicrobial Product Protection

TB - 300: Surface Care, Thermoforming and Fabrication Guidelines

Introduction

KYDEX® FST with Microban® protection is a fully compliant aviation grade thermoplastic sheet.

Forming Guidelines

- Always pre-dry KYDEX® FST with Microban® before forming to avoid issues due to moisture. Refer to guidelines below.
- Mold temperature must be maintained at a minimum of 93°C (200°F) to avoid chill marks.
- Typical heater settings (percentage timers) are 30% - 50% top heaters and 50% - 70% bottom heaters.
- Two-sided (sandwich) heaters are recommended for forming KYDEX® FST with Microban®.
- Cycle times will vary depending on the oven conditions, type of heating elements, and cooling efficiency.
- Ideally, the core sheet temperature should be within +/- 5.6°C (10°F) of the surface temperature.
- Heating time will vary with heater type and heater settings.

Forming Temperature Guidelines:

Thickness	Forming Temperature
1.50mm to 3.20mm (0.080 to 0.125in)	182 - 196°C (360 - 385°F)
≥ 3.20mm (0.125in)	196 - 204°C (385 - 400°F)

**Do not exceed 204°C (400°F) surface temperature*

Drying Guidelines

It is very important to make sure that KYDEX® FST with Microban® sheets are free of moisture prior to thermoforming by adhering to the following drying guidelines. The use of a hot air circulating oven is recommended.

Thickness	Drying Time (Hours) at 120°C (248°F)
1.50mm (0.059in)	1.5
2.00mm (0.078in)	3.0
3.00mm (0.118in)	4.0
4.00mm (0.156in)	10.0
5.00mm (0.195in)	16.0

Design Criteria

- The minimum recommended radius for simple vacuum forming is generally equal to the thickness of the starting sheet. In addition, an easy to form radius is 4 times the thickness of the starting sheet.
- Mold Shrinkage of 0.5 – 1.0% should be expected, depending on forming/cooling conditions.
- A minimum draft angle of 3% should be allowed for easy part removal.

Durability by Design®

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Fabrication Guidelines

KYDEX[®] FST with Microban[®] sheet can be cut, drilled, or machined with conventional woodworking equipment; special tools designed for plastic fabrication are not necessary but may result in cleaner edges.

Cracking, stress whitening, or melting of the material is a result of inducing too much stress or heat into the part during the routing or cutting process. Minimizing heat build up along with proper support and clamping will produce the cleanest edges.

Mechanical Fastening

If bonding is not practical, KYDEX[®] FST with Microban[®] can be mechanically fastened following a few simple guidelines:

- Oversize holes by 1.5mm (1/16in) to allow for dimensional changes from expansion and contraction due to temperature changes.
- To minimize cracking and stress whitening, the use of rubber washers is recommended in combination with large screw or rivet heads. Do not over-tighten the fasteners.

Gluing Guidelines

An adhesive should not be selected solely based on bond strength information. Factors such as the cure speed, environmental resistance, thermal resistance, and substrate types will play a critical role in determining the best adhesive for a specific application.

KYDEX[®] FST with Microban[®] can be adhered to itself and other thermoplastics using some of the more popular adhesives: two-part acrylics, cyanoacrylates, and two-part urethanes. Although surface treatment is not necessary for a good bond, surface roughening is a simple, low cost method of increasing the bondability of KYDEX[®] FST with Microban[®]. All surfaces should be cleaned with isopropyl alcohol prior to bonding regardless of adhesive used.

Two-part acrylic adhesives will offer the best overall adhesion to the most substrates.

Cyanoacrylates will work best in small, smooth surface areas where a structural adhesive is not needed. These adhesives are very poor gap fillers. These also tend to flash off quickly and have a very rapid cure rate so working time is very limited. There is also a potential for stress cracking if uncured adhesive is left on the surface too long.

Two-part reactive urethanes should also create a good bond when adhering KYDEX[®] FST with Microban[®] to itself.

**As with any application, please contact the adhesive manufacturer for proper adhesive recommendations for polycarbonate based plastics, technical information and application directions. Always test for suitability before use.*

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Chemical Resistance

The chemical resistance of KYDEX® FST with Microban® depends on the type of chemical involved, the concentration level, exposure time, temperature, and stress level of the part.

- KYDEX® FST with Microban® has good chemical resistance to dilute acids, alcohols, salts, and many mild detergents and cleaners.
- KYDEX® FST with Microban® may decompose or craze when used with alkalis, solvents, gasoline, greases or oils.

**To ensure compatibility, always test a sample of KYDEX® FST with the chemical or cleaners, the technique and conditions to be used with polycarbonate based polymers.*

Cleaning

- Do not use cloths containing grit or abrasive particles, or kitchen scouring compounds to clean KYDEX® FST with Microban® primary surface.
- Do not use razor blades or other sharp instruments to scrape the surface.
- Do not clean KYDEX® FST with Microban® in direct sunlight or in elevated temperatures.
- Do not use gasoline to remove stains.
- Always follow cleaning with a clean water rinse.

The best way to clean KYDEX® FST with Microban® is with a solution of warm water and a mild household detergent. Use a clean, soft cloth and rinse with clean water after washing.

For more stubborn stains or adhesive residue, the following cleaning agents may be used at room temperature:

- Methyl alcohol
- Ethyl alcohol
- Butyl alcohol
- Isopropyl alcohol
- Naphtha VM&P

**Always follow with a clean-water rinse.*

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