Decorative Textures Technical Brief

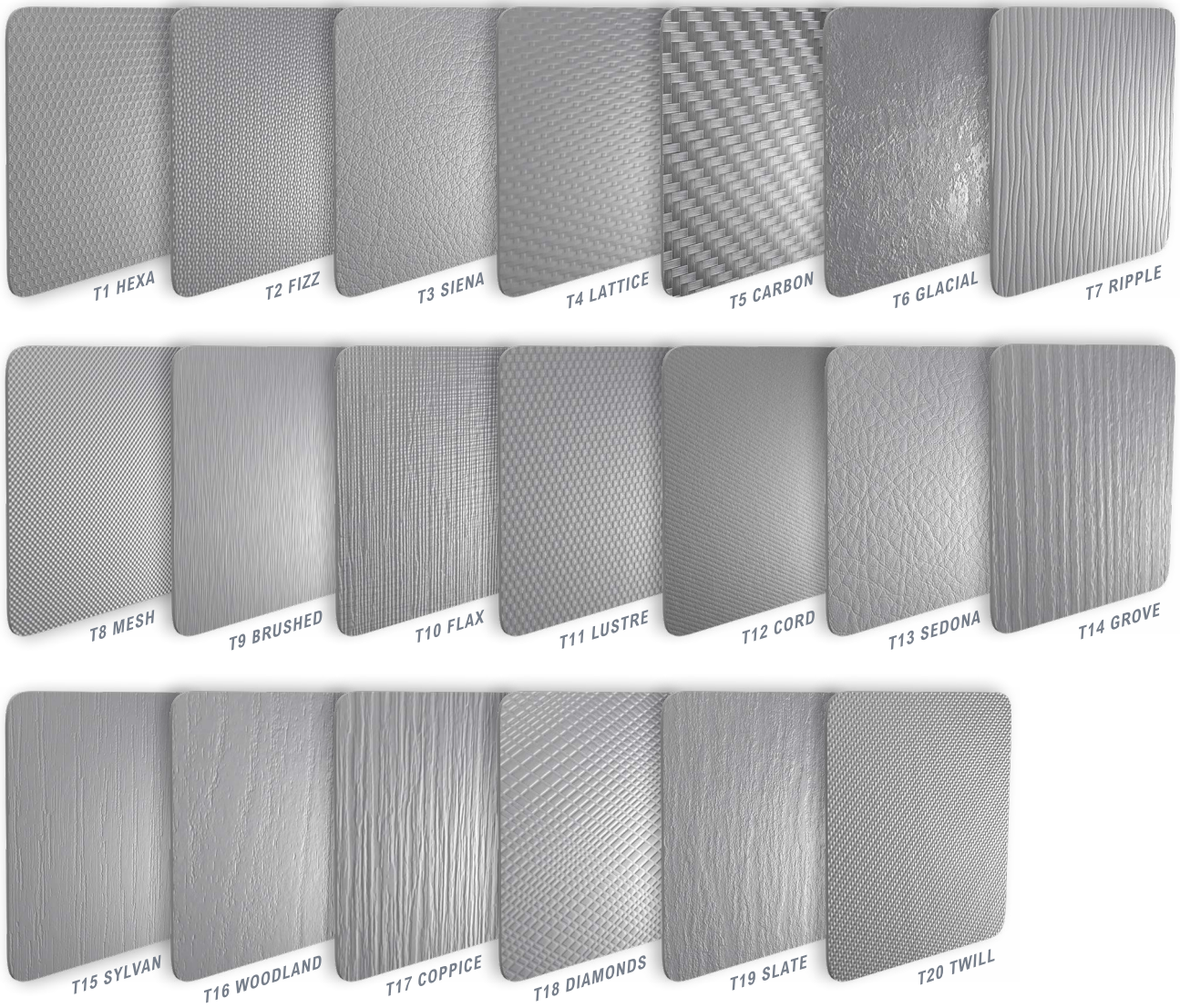
Maintains Properties
Mechanical properties, durability, and longevity

Design Benefits
Possibilities are virtually limitless

Introduction

KYDEX® Thermoplastics are available in multiple textures to promote innovative tactile design.

Traditionally, texture has been chosen for its aesthetics or functional characteristics, like improving the durability of the surface. However, customized texture can also be used to communicate the brand story, and enhance the mood and experience of the consumer.



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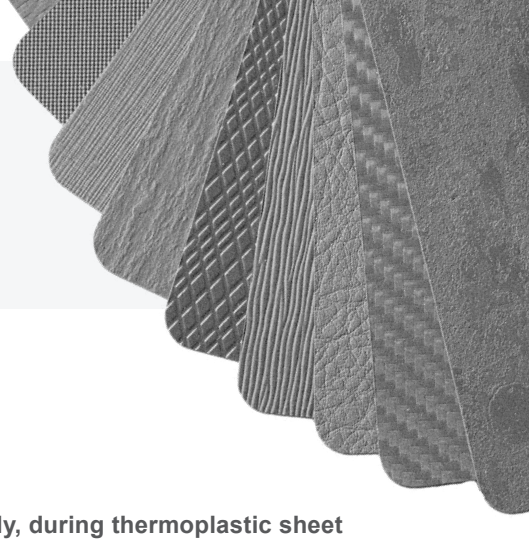

Sheet Texture vs In-Mold Texture

Texture is achieved using a variety of manufacturing processes – most commonly, during thermoplastic sheet production or the thermoforming process.

- Sheet texture is produced by embossing the texture onto the thermoplastic sheet in production
- In-mold texture is created by forming onto a tool with a textured surface through the thermoforming process.

	Sheet Texture	In-Mold Texture
When	Sheet production	Part production (Thermoforming)
How	Embossing rolls Textured plates	Texture on tool surface
Thermoformer Requirements	None – standard thermoforming equipment	Pressure forming equipment
Tooling Considerations	Standard male/female vacuum tools	Pressure tools designed for contact with primary part surface; primarily female tooling
Finished Part Texture	Part texture will stretch; distortion is proportional to draw ratio and geometry of tooling	Part texture will match tooling texture; no stretch or distortion

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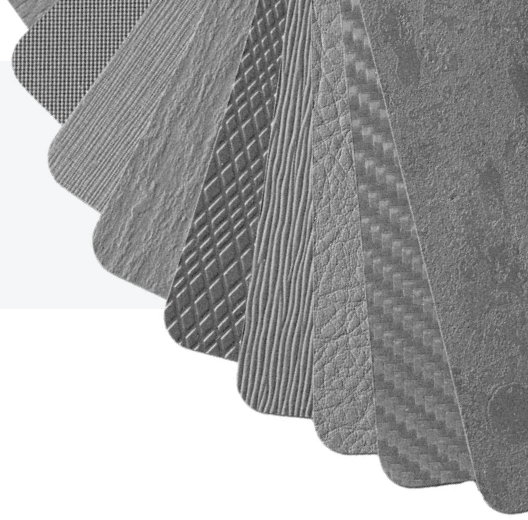

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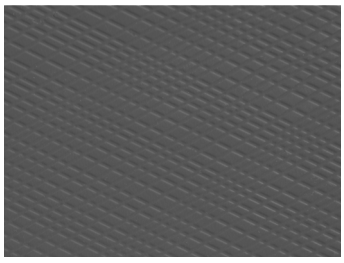
Considerations

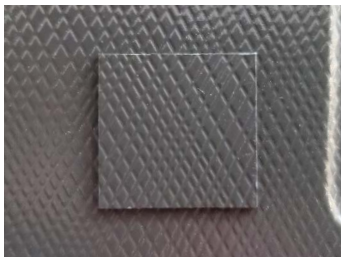
DEPTH OF DRAW (Texture Stretch)

As thermoplastic sheet with decorative texture is formed into 3D shapes, the texture will stretch with the substrate.

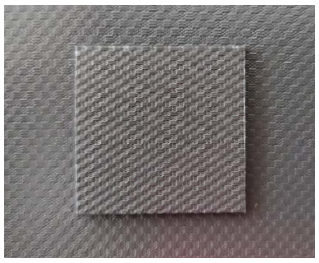
The amount of texture stretch is proportional to the depth of draw. The deeper the draw, the greater the texture stretch and potential for texture wash out.



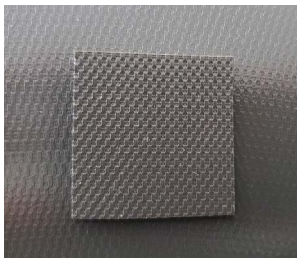
Flat sheet, no distortion



Texture distortion on 1 ½” part draw



Texture distortion on 2 ½ - 3” part draw



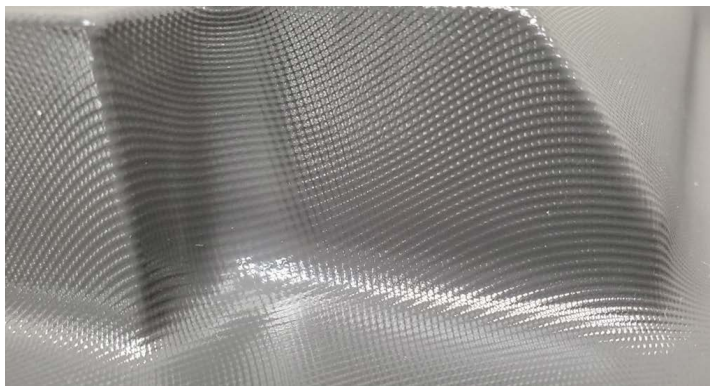
Texture distortion on 4 – 5” part draw

PART GEOMETRY (Texture Distortion)

Part geometry affects the appearance of decorative texture on the final part.

Texture distortion increases with more complex designs and multi-angle features.

Texture distortion of a linear pattern on a curved geometry



Texture distortion of a linear design on a multi-angled part

Texture curves on parts with rounded features

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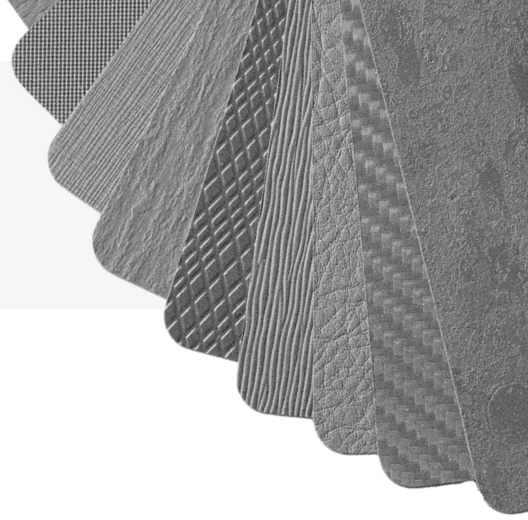


Considerations *Continued*

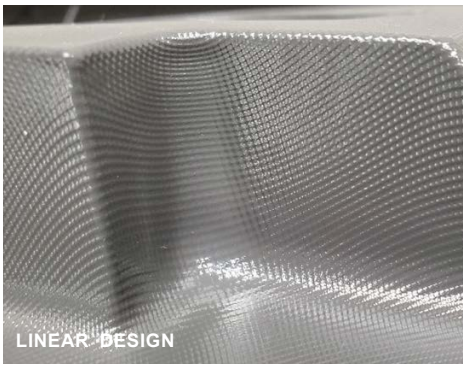
LINEAR VS. RANDOM TEXTURE DESIGN

The depth of draw and overall part geometry will affect decorative texture designs differently.

Linear designs are the most affected, especially on parts with complex geometries or deeper draws. Texture stretch and distortion are less noticeable in random designs, which are preferable for parts with deep draws or complex geometry.

Decorative texture distortion on a curved part

Decorative texture distortion on a multi-angled part



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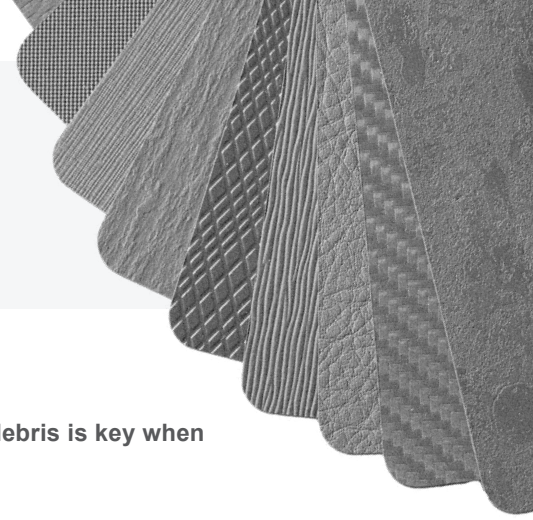

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Cleanability

The ability to keep the surface clean and free from debris is key when selecting a decorative texture design.

Consider the following:

- Panel location
- Exposure to potential staining agents and contaminates
- Cleaning and frequency

DIRT/DEBRIS

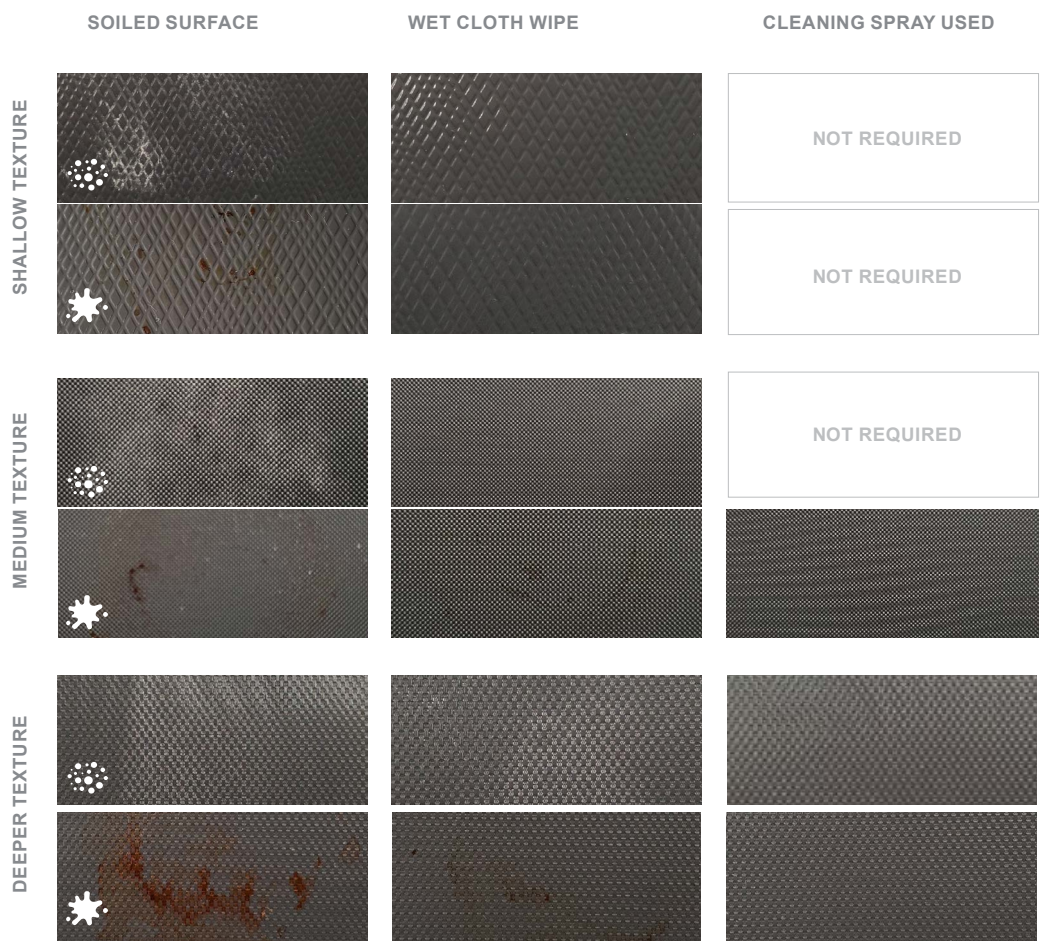
The ease of cleaning tends to be proportional to the depth of texture.
More shallow textures are typically easier to clean.

STAINING AGENTS

Textures may require additional cleaning if wiping the surface is insufficient.
Staining agents like food or dried liquid may require scrubbing or the use of a liquid cleaner.

Deeper textures tend to require additional cleaning, while designs with open valleys and rounded features are easier to clean.

Geometries that enclose valleys or square features may entrap dirt and require additional scrubbing to clean.



Questions? 800.682.8758 appLab@kydex.com kydex.com

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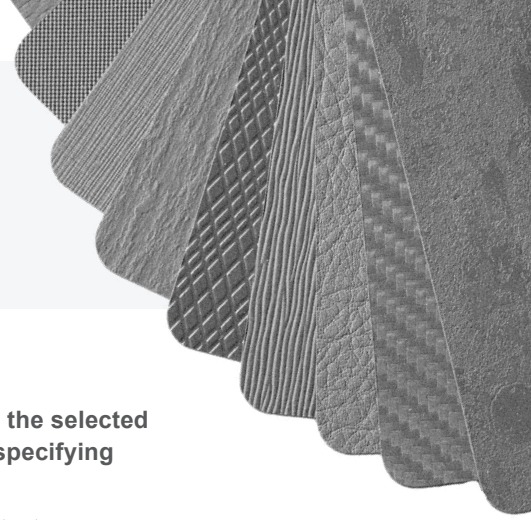

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Process Optimization

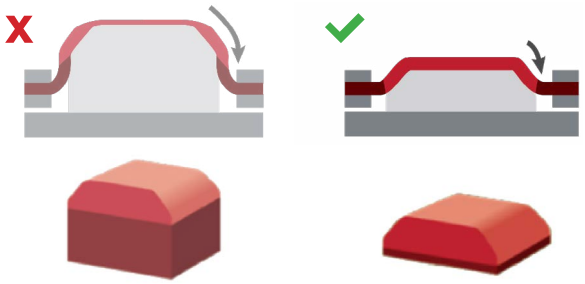
Early collaboration with appLab™ and the selected thermoformer is recommended when specifying decorative textures.

Optimize tool and part design to reduce texture stretch and distortion.

RECOMMENDED

REDUCING TRIM LINE

Minimizing the line of the formed part will reduce the height of the tool. By reducing the depth of draw, the finished part texture stretch is minimized.



SYMMETRICAL TOOL DESIGN

Symmetrical tooling promotes more even texture with less stretch and distortion across the entire part.

MATERIAL PRE-BLOW

Pre-blowing the material during the forming process prevents texture stretch and distortion by distributing the entire sheet more evenly over the tooling.

SPLITTING PART DESIGN

To reduce texture stretch and distortion, split up parts with a large depth of draw or asymmetrical geometry.

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