

# HIGH PERFORMANCE RETAIL STORE FIXTURES MADE FROM KYDEX® THERMOPLASTIC SHEET



Curbell Plastics, Inc.  
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***Move over high pressure laminates.  
A new generation of surface materials offers improved  
aesthetics, durability, and fabrication characteristics.***

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## INTRODUCTION

The retail business is becoming increasingly competitive and eye-catching displays and fixtures can have a tremendous impact on the amount of consumer traffic in a store. Having the right displays can also draw attention to new products and promotions, which can positively impact sales.

Since the 1930's, retail fixtures have been manufactured from traditional high pressure laminates that are applied to particle board or MDF (medium density fiberboard) substrates. High pressure laminates are limited in a number of ways including having poor aesthetics and being difficult to fabricate. They are also prone to damage (chipping and cracking) when used in high traffic retail environments.

KYDEX® Thermoplastics are widely used in the aerospace industry to create tough, durable, aesthetically pleasing aircraft interiors. Aerospace applications include interior wall panels, arm rests, seating components, and passenger tray tables. Recently, store fixture manufacturers have started using KYDEX® Thermoplastics instead of high pressure laminates to create high-end tabletops, cash register counters, shelving, kiosks, and wall panels. Thin sheets of KYDEX® Thermoplastics are applied to particle board and MDF using standard woodworking tools and techniques. Store displays manufactured from KYDEX® Thermoplastics are beautiful, easy to fabricate, and incredibly durable and long-lasting.

## AESTHETICS

Aesthetics are of paramount importance for retail fixtures, where slight changes in texture, color, or gloss can be the difference between a display that builds a store's brand image and one that detracts from it. The color engineers and technicians at SEKISUI SPI (the manufacturer of KYDEX® Thermoplastics) are truly masters of their craft. If a fixture manufacturer needs to match the color of an existing high pressure laminate, SEKISUI SPI has color matches for many different varieties of Nevamar®, Wilsonart®, and Formica®. If a designer wants a custom color, SEKISUI SPI can create one in their in-house designLab™ in a matter of days. KYDEX® sheet is available in neutral beige and brown colors, metallics, soft pastels, warm woodgrains, and bright, glossy colors that give a dramatic appearance. Some of SEKISUI SPI's proprietary colors appear to shimmer as they catch the light. This makes them popular for high-end display applications where a modern, high-tech look is desired. Unlike many plastic sheet manufacturers, who require truckload buys for custom colors, SEKISUI SPI will manufacture custom colored sheet in lots as small as 500 pounds with lead times as short as a few weeks. KYDEX® sheet is available with eight different surface textures, which allows for additional design flexibility. Of the eight textures, PK Cashmere is the most commonly used due to its durability and ease of cleaning.



*KYDEX® sheet is available in many different colors, textures, and patterns. Custom colors can be easily produced with low minimum orders and short lead times.*



*These retail displays are manufactured from gray (left) and woodgrain (right) KYDEX® sheet. The material is available in a wide range of colors and textures.*

One important advantage of KYDEX® sheet is that the color of the material is consistent throughout the thickness of the sheet. This results in beautiful edges that don't have the "black lines" associated with the edges of high pressure laminates. This makes KYDEX® sheet an excellent choice for store fixtures and displays when a clean, modern appearance is desired.



*The display on the left was manufactured from high pressure laminate. The "black line", which detracts from the appearance of the piece, is clearly visible. The display on the right was manufactured from KYDEX® sheet, which has color throughout the material.*

## PERFORMANCE

Breakage due to shipping, cleaning, and in-store traffic is a leading cause of failure for retail fixtures. This is largely due to the brittle nature of high pressure laminates, which will often chip when impacted.



*High pressure laminates are brittle and will often chip in high traffic areas such as aisles and rest rooms.*

Engineers measure the toughness of materials in three ways: via notched Izod impact, tensile elongation, and ball impact testing.

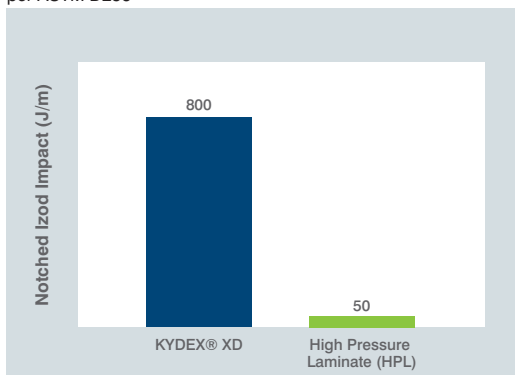
Notched Izod impact testing involves hitting a specimen of material with a mass that is mounted on a pendulum and then measuring the energy required to break the specimen. When measured using the notched Izod method, KYDEX® sheet has over 15 times the impact resistance of high pressure laminate.

Tensile elongation testing measures how far one can stretch a material before it will fail. KYDEX® sheet exhibits over 60 times the tensile elongation of high pressure laminate.

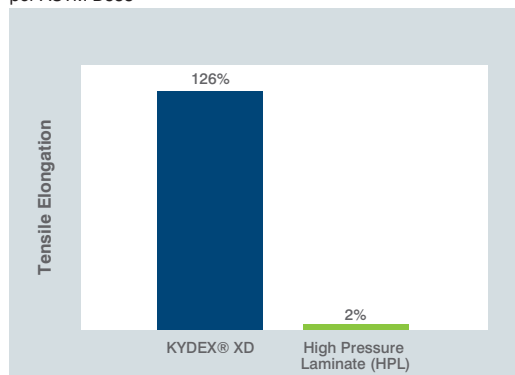
Ball impact testing involves laminating a thin sheet of material to a particle board substrate and then dropping a round metal ball onto the surface. The ball is dropped at increasing heights until it damages the surface. KYDEX® sheet withstands ball drops from approximately twice the height of impacts that damage high pressure laminate.

All three of these tests indicate that KYDEX® sheet is significantly tougher and more durable than high pressure laminate. Because of this, retail displays made from KYDEX® sheet resist damage during shipping and during use in the high traffic areas of retail stores.

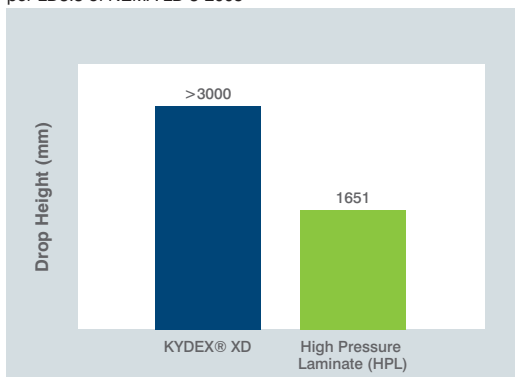
**Notched Izod Impact**  
per ASTM D256



**Tensile Elongation**  
per ASTM D538



**Ball Impact Resistance**  
per LD3.8 of NEMA LD 3-2005



*Engineering data show that KYDEX® Thermoplastic is far tougher and more durable than high pressure laminate.*





*Kiosks made from KYDEX® Thermoplastics have improved aesthetics and durability compared with kiosks made from high pressure laminates.*



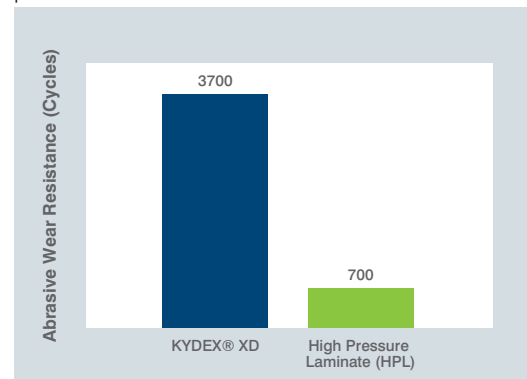
*KYDEX® sheet was used for these shoe displays because of its durability and resistance to chipping.*

Retail fixtures can also become damaged due to abrasive wear as merchandise and currency are slid across counters. This is often a problem for stores that sell heavy products such as hardware or automobile parts. High pressure laminate consists of a thin layer of printed paper on top of a brown phenolic core. Once the printed paper surface has worn away, the brown phenolic substrate shows through. This detracts from the appearance of retail fixtures. KYDEX® sheet has color throughout the thickness of the material, which allows it to show consistent color even after years of use. The graph below shows that in laboratory tests, solid colors of KYDEX® sheet withstand over 5 times the number of cycles of abrasive wear compared with high pressure laminate before the decorative surface is worn through.

KYDEX® sheet has the additional benefits of being fire resistant (class 1/A fire rating), antibacterial, and antifungal, all of which improve customer safety in a retail environment. KYDEX® sheet is 100% recyclable, which supports sustainability initiatives.



**Abrasive Wear Resistance**  
per LD3.13 of NEMA LD 3-2005

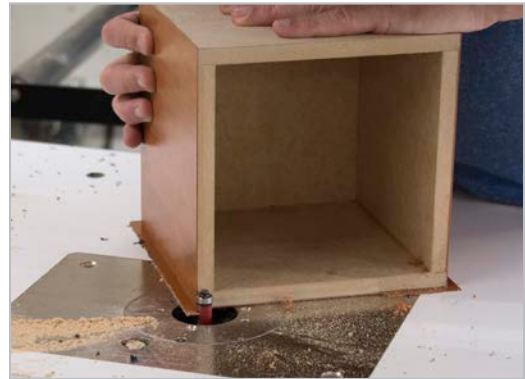


*This countertop, made from high pressure laminate, illustrates the poor abrasion resistance of the material. The decorative surface is completely worn through leaving the brown phenolic substrate exposed. The laboratory test results graphed on the right show that KYDEX® sheet has superior abrasive wear resistance compared with high pressure laminate, making it an excellent choice for retail display counters.*



## FABRICATION

Fabricators who are used to working with traditional store fixture materials such as MDF, particle board, and high pressure laminates will simply love working with KYDEX® Thermoplastics. The material cuts easily using standard woodworking machinery such as table saws and routers. Woodworkers will immediately appreciate the way that KYDEX® sheet machines, with smooth cutting action and without the chipping and cracking associated with brittle high pressure laminates. Several fabricators have described KYDEX® sheet with the term “cuts like butter.” The cutting waste takes the form of benign plastic flakes, unlike the smelly dust generated by high pressure laminates. Additionally, the edges of KYDEX® sheet are not sharp like those of high pressure laminates, which makes the material safer to fabricate.



*KYDEX® sheet is easy to cut using standard woodworking tools such as table saws and routers.*

KYDEX® sheet is easy to drill and easy to apply to particle board or MDF using water based or solvent based contact cements. 3M™ Fastbond™ contact adhesive 30NF, 3M™ plastic adhesive 2262, and Wilsonart® H2O contact adhesive have all been successfully used to bond KYDEX® Thermoplastics.

Care should be taken when trimming KYDEX® sheet edges with a flush trim router bit. If excessive hand pressure is used, the router bearing may mark the finished surface. Light hand pressure will result in a beautiful finish. If solvent based contact cement is used to laminate KYDEX® sheet, any cement overspray should be removed using high quality mineral spirits. Low quality mineral spirits may contain toluene or acetone and these materials should not be used with KYDEX® sheet. Several commercial cleaning agents including Klean-Strip™ odorless mineral spirits and Goof Off™ 2 work well to clean up adhesive overspray. Aggressive chemicals such as acetone and MEK should be avoided. Final edge smoothing can be accomplished with a file or a deburring tool.

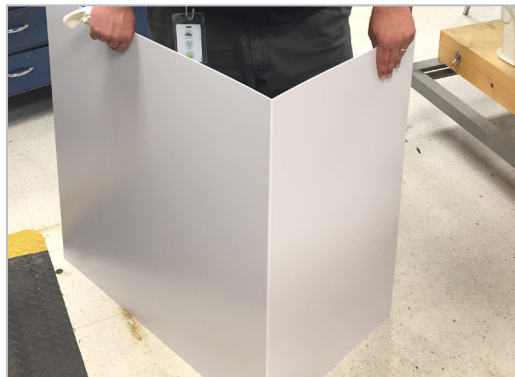


*KYDEX® sheet can be applied to MDF or particle board using contact adhesive. The edges of KYDEX® sheet can be finished using a file or a deburring tool.*

KYDEX® sheet is far less stiff than high pressure laminate. This allows it to be easily applied to the curved surfaces characteristic of some high-end store fixtures. Unlike high pressure laminate, KYDEX® sheet can be cold formed to create sharp corners using a sheet metal brake. This simplifies the fabrication of internal corners and external corners with angles other than 90 degrees. KYDEX® sheet can also be formed into boxes using the miter-fold fabrication technique. This involves laminating KYDEX® sheet to MDF or particle board and then cutting grooves in the laminated panel using a special router bit. The depths of the grooves are carefully controlled so that the substrate is cut away but the KYDEX® sheet is left uncut. The fabricated panel is then folded up and assembled into a finished box.



*KYDEX® sheet is far less stiff than high pressure laminate, which allowed it to be easily bent around the curved side of this display counter and the interior surfaces of these shelving units.*



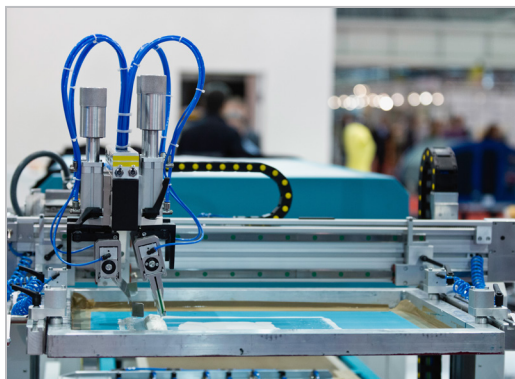
*Due to its ductility, KYDEX® sheet can be bent in a sheet metal break (top). This allows it to be fabricated into angled retail counters (left) without the seams that would have been required with high pressure laminate.*

*KYDEX® sheet can be quickly fabricated into boxes using the miter-fold technique. (below)*





KYDEX® sheet can be thermoformed, die cut, and perforated, and it can be decorated via screen printing and flat-bed digital printing. Inks that are formulated for use on PVC substrates generally work well with KYDEX® sheet.



*KYDEX® sheet is easy to decorate via screen printing and flatbed digital printing.*

When extreme durability is required, KYDEX® sheet can be permanently bonded to the top surface and edges of a machined sheet of MDF using a process referred to as membrane pressing. This involves softening KYDEX® sheet in an oven and then draping the softened material over a sheet of MDF with a thermally activated adhesive on the surface. This process creates seamless store fixture surfaces that have enhanced durability. Fixtures manufactured from KYDEX® sheet using membrane pressing are well suited for high traffic areas in retail stores. Membrane pressing also allows for some interesting design features including contoured edges and even logos or other graphics “molded” right into the membrane pressed piece.



*The tabletops shown in the left-hand photograph are manufactured using the membrane pressing process. KYDEX® sheet is formed over an MDF substrate creating a durable, seamless work surface. The photograph on the right shows how text and other graphics can be “molded” into a flat surface by machining the graphics into MDF and then membrane pressing KYDEX® sheet over the surface.*

## SUMMARY

For retailers wishing to achieve unique aesthetic properties and lasting durability, KYDEX® Thermoplastics provide an upgrade from the look of traditional high pressure laminates. KYDEX® sheet is available in virtually any color and texture and its ease of fabrication provides retail fixture manufacturers with tremendous design flexibility.

For more information on KYDEX® Thermoplastics or to obtain color and texture samples, contact Curbell Plastics at 1-888-287-2355.





## ABOUT THE AUTHOR

Dr. Keith Hechtel is Sr. Director of Business Development for Curbell Plastics, Inc., based in Orchard Park, NY. Dr. Hechtel has a Bachelor of Science Degree in Geology, a Master of Science degree in Industrial Technology, a Doctor of Business Administration degree, and over 25 years of plastics industry experience. Much of his work involves helping companies to identify plastic materials that can be used to replace metal components in order to achieve quality improvements and cost savings. Dr. Hechtel is a recognized speaker on plastic materials and plastic part design. He has conducted numerous presentations for engineers, designers, and fabricators in both industrial and academic settings.



Connect with Dr. Hechtel on LinkedIn.

## TECHNICAL EXPERTISE

Curbell white papers are intended to provide engineers and designers with basic information about the engineering polymers available as sheet, rod, tube, and film stock from Curbell Plastics. We invite you to contact Curbell via e-mail at [technicalsupport@curbellplastics.com](mailto:technicalsupport@curbellplastics.com) to discuss applications in detail.

## ABOUT CURBELL PLASTICS

For 75 years, Curbell Plastics has been one of the nation's leading providers of plastic sheets, rods, tubes, and films, as well as fabricated parts, adhesives, and prototyping materials. Our customers range from small local businesses to large Fortune 500 companies and government agencies. We partner with organizations in dozens of industries, including aerospace, pharmaceutical, machinery manufacturers and sign fabricators. At Curbell, we understand the unique demands of each market and we have the expertise to help you meet your business needs. Whether your objective is to reduce manufacturing costs, improve productivity, or increase product reliability, Curbell can help.

## OUR CAPABILITIES

Our branch network includes sales and warehouse locations throughout the United States. We offer a number of value-added services including custom cutting, fabrication, packaging, and kitting, as well as warehousing for just-in-time delivery. With Curbell, you get the plastics you want and the peace of mind you need, from technical support and design assistance at the earliest stages of product design, through production and after-sale support for each product we sell.

## PUT US TO WORK FOR YOU

At Curbell, we are committed to providing the highest level of service to our customers. We recognize the urgency of customer needs, and we pride ourselves on providing quick and proactive solutions. Our tag line says it all – we appreciate the opportunity to earn your business and we invite you to “**Put us to work for you.**”

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