

Rapid Texture Finishing Tips



Finishing Tips for Rapid Texture

Introduction

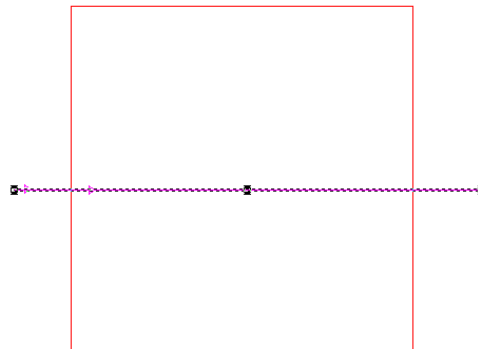
Creating a cool design in EnRoute is the first step toward a nice finished piece. Then you have to produce it on your router using your selected material, and finally you need to apply finish. We get a lot of questions about finishing rapid texture pieces. As with any piece you might design and produce, there is a pretty wide choice of materials that you can use, and a wide choice of finishing methods. We decided to document some of these options, and you are encouraged to use this document as a starting point. We chose high-density urethane foam (HDU), medium-density fiberboard (MDF), polyvinyl chloride (PVC), and solid wood as our materials. We used both spray and brush application techniques, and we varied the amount of surface preparation we performed on each. The idea was to get a sense of the range of surface finishes you might expect by using different finishes and differing amounts of sanding of the surfaces.


This is by no means an exhaustive exercise, but hopefully it helps provide some information about how you can approach your finishes. We have tried to document each of the finishing steps with photographs, and we also provide some opinions about how the pieces appear to use at each stage. Our goal with each piece was to produce something that we would be satisfied providing to a customer as a finished product.

Create the Piece

The first step is to create the sample. This sample uses a 1 inch ball end tool to cut the pattern.

The first step is to create the seed contour. Draw a line across the plate. This is the contour that will be used with the rapid texture tool to create the texture.



Select the contour and then click on the Rapid Texture Icon  to open the dialog. Enter the following parameters:

The size of the panel is 7" x 7"

Wave Length = 3.

Horizontal Amp = .3

Vert. Amp = .3

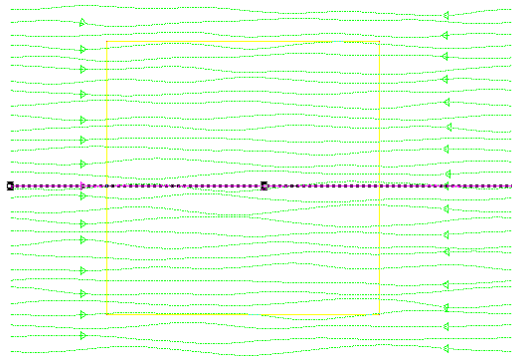
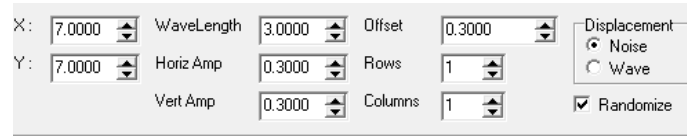
Offset = .3

Rows and Columns = 1

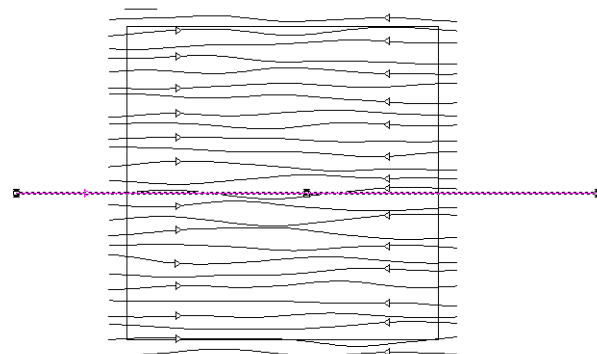
Displacement = Noise


Randomize = checked

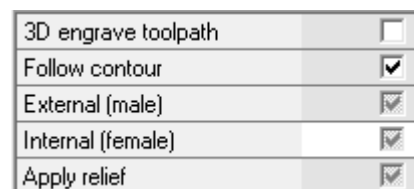
After entering the parameters, click on the preview button. The green lines represent the contours that will be created. If you are happy with the contours click, Apply.



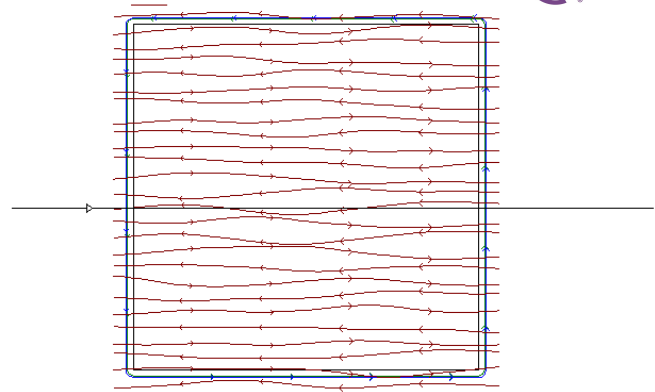
This image shows the contours that have been created. An outline contours is also created to outline the perimeter of the panel.




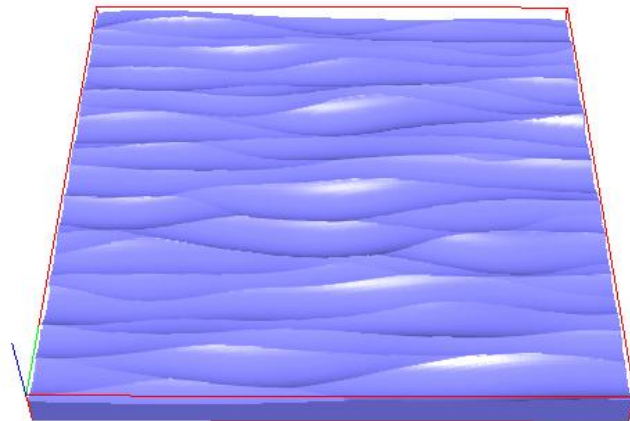
The next step is to apply an engrave toolpath.  Add the 1 inch ball end tool with a depth of .01. Make sure that you check the follow contour parameter. This means that the tool will follow the contour when cutting.



This image shows the toolpaths applied to the contours and a Routing Offset toolpath applied to the outline contour.



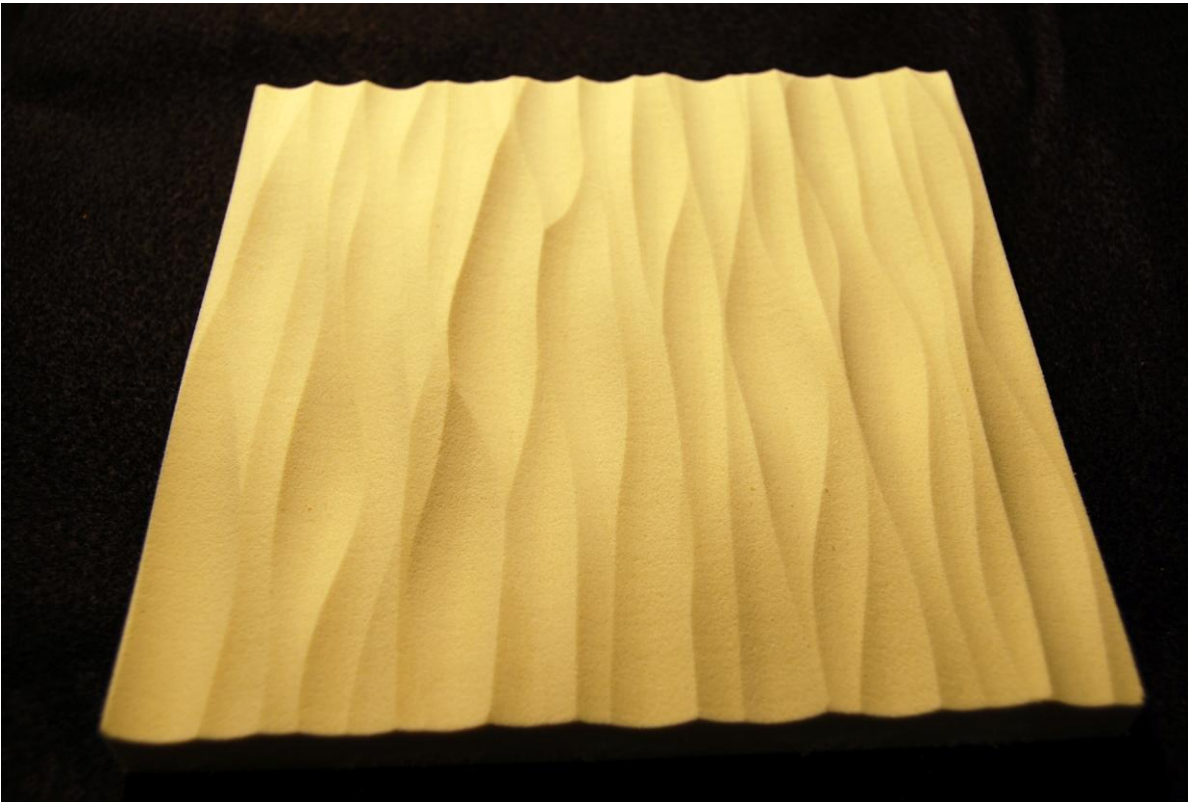
To see the results of the toolpaths that you have created, click on the simulate ortho icon .



HDU Board

High density urethane, commonly referred to as HDU or by common brand names such as Precision Board or Sign Foam is often used as an alternative to wood for interior and exterior applications. HDU Board is light weight, easy to fabricate, easy to paint and is rot, moisture, and insect resistant. The basic difference between densities is the cell wall thickness. The higher the density the thicker the cell wall. Thicker cell walls mean the cells are finer, stronger, tougher, and heavier. Higher density also means higher price.

We will demonstrate three different procedures to finish 15 pound HDU board and also we will show a finish on a piece of 40 pound HDU board.



Starting with the HDU board. This is the 15 pound HDU board right off of the machine. This piece has not been sanded. It milled very nicely. There are not a lot of tool marks. The 15 pound HDU board is more porous than the 30 or 40 pound HDU board.

Example 1 - 15 pound HDU:

Spray both the primer and paint without sanding.

In this example we wanted to see how the finish would look without any sanding. We found that the paint surface does show some texture, but in general you can achieve a nice finish without sanding. This would be a good finish for very large areas.

The steps for finishing this example are as follows:

1. Sand the edge of the sample piece to remove any loose material from the milling process.
2. Spray the primer using Evercoat Dura Build (high build acrylic primer.)



After the first coat of primer, you can still see the texture of the HDU. It seems to be a bit porous at this point.

3. Spray the second coat of primer.



You will notice that the second coat of primer makes the surface of the HDU much smoother. More of the cells have been filled in.

4. Spray paint.



The paint used on this example is Acrylic Enamel auto paint. We applied three coats. There was no sanding between coats of primer and paint. The surface shows this with a little bit of texture in the finish. Overall, this finish looks very nice for not sanding at all.

Example 2 - 15 pound HDU Foam:

Spraying both the primer and the paint, but sanding between coats.

This example adds the hand sanding in between coats of primer. Hand sanding with sand paper on a textured surface can take a lot of time depending on the size of the project and the texture that was created. The surface is a smoother finish than not sanding but it may not be worth the time spent if the project is very large. On the other hand, if you are trying to achieve a really smooth finish, this method works very well.

1. Sand the edge of the sample piece to remove any loose material from the milling process.
2. Spray the Evercoat Dura Build primer. The finish at this point still reflects the texture of the HDU. It shows holes in the finish and seems to be very porous.



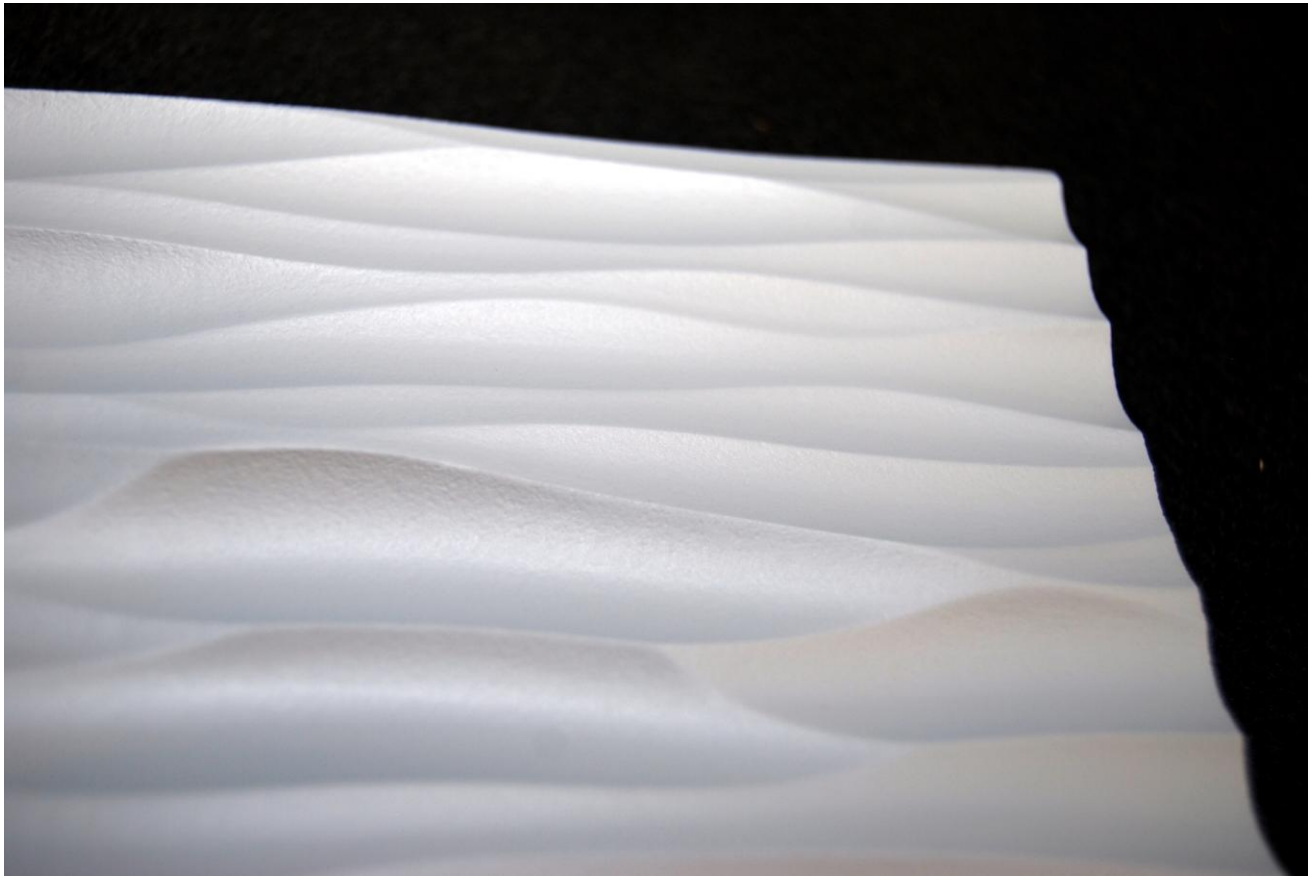
3. Hand sand the piece. A very light sanding is applied to the sample piece. The coat of primer is not very thick and can easily be sanded through to the HDU, so care must be taken to lightly sand the piece.

4. Spray a second coat of primer.



Once the second coat of primer is applied to the sample piece, the texture becomes a lot more consistent and smooth. You can still see some of the texture of the HDU.

5. Hand sand. Spray the third coat of primer.



After the third coat of primer is applied the surface smooth and the cells have been filled in.

6. Spray the paint. The same Acrylic Enamel Automotive paint has been used for all of the sprayed examples that we demonstrate in this document. We applied three coats.





The surface of the sample piece is very smooth. Comparing it to the piece that was not sanded, this finish is much smoother. This would be a good method to use to achieve a very smooth finish on a smaller project.

Example 3-15 pound HDU Board:

Brushing the primer and paint.

In this example we are exploring the use of Coastal Enterprises FCS-88 WB Primer. This is a primer that is specifically made for application to HDU board. It is a very dense primer that fills the cells of the HDU board to create a smooth and consistent finish. The application of the primer is a bit different but the results that can be achieved with practice is really very nice.

1. Sand the edge of the sample piece to remove any loose material from the milling process.
2. Using a paint brush, brush the primer onto the sample piece.

The primer that was used in this example is the FSC-88 WB primer from Coastal Enterprises. It is a sprayable, brushable, rollable waterbased primer/filler that is used to fill and smooth Precision Board prior to finishing with paints and coatings. It dries rapidly and sands easily. There are specific finishing methods for this product. There is a video on the Coastal Enterprises website that gives specific instructions for the application of the FSC-88 WB. <http://www.precisionboard.com/>



This image is taken after the first coat of primer. With this type of primer there is no sanding after the first coat. The primer is not yet thick enough to fill up the cellular texture of the foam. These cells should start to fill up with the next coat of primer.

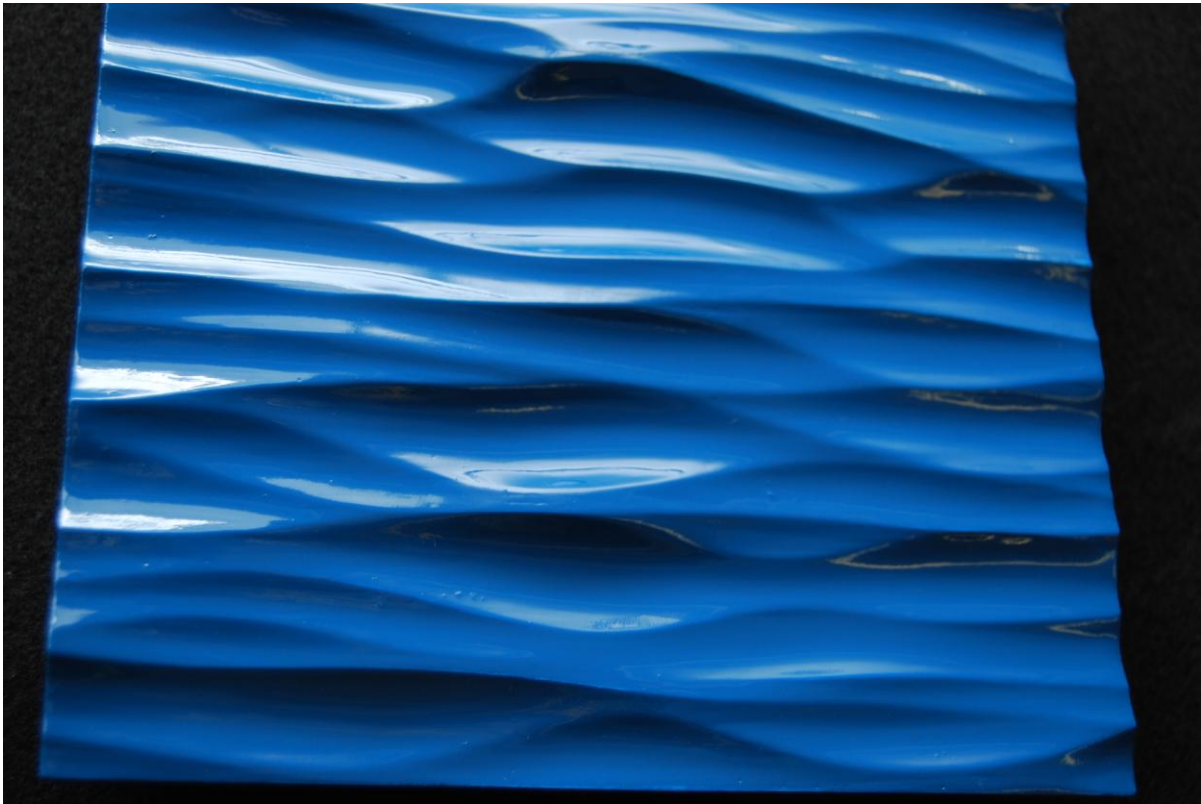
3. Brush a second coat of primer to the sample piece.



After the second coat of primer the brush marks are visible and the cells of the HDU have been filled. At this point there is enough of the primer built up to be able to sand the surface and add a third coat of primer as shown in the next image.



4. Hand sand the piece. You are going for a smooth finish. Follow the instructions from Coastal Enterprises to achieve a smooth finish in the primer coat.
5. Brush on Enamel paint.

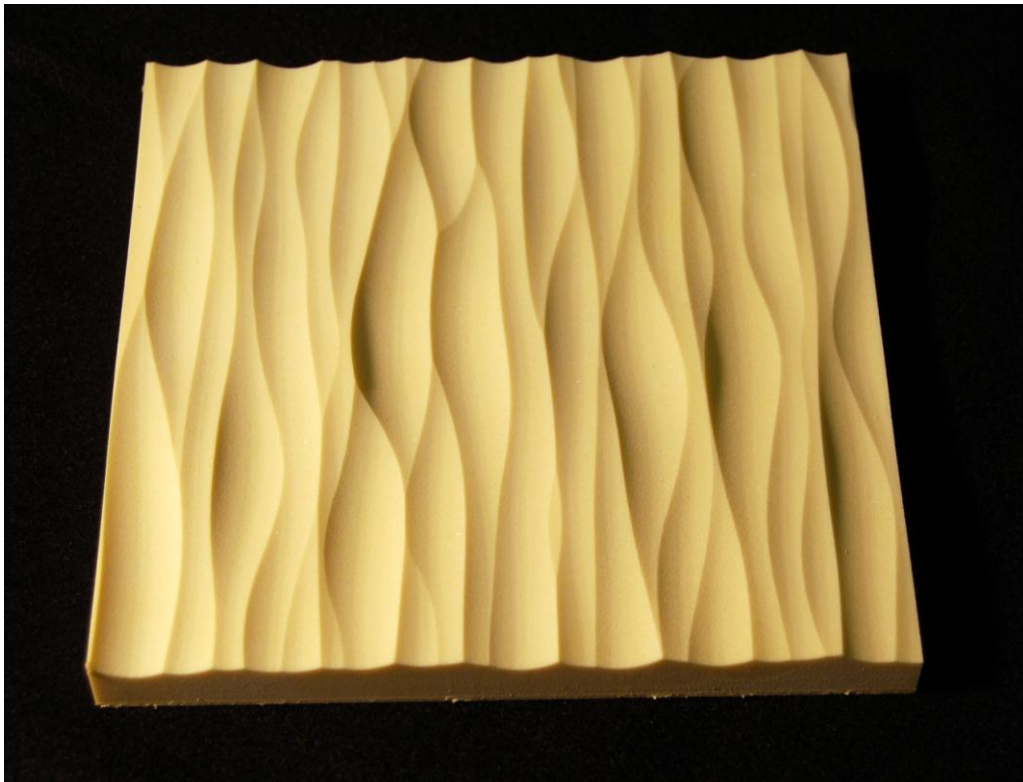


There were 2 coats applied to this sample piece. It turned out smooth. You can still see some imperfections in the finish, but a very good finish for using the brushing technique.

40 pound HDU Board

Spray primer and hand sand.

Using a higher density HDU Board may be desirable for different reasons. The higher the density, the stronger the board and the smaller the cells are. With smaller cells, you can achieve a smoother surface with less work than it would take to achieve the same smooth surface with a lower density HDU Board. This example showed us that we did not need as many coats of primer to achieve the same smooth and consistent surface as we did with the 15 pound HDU Board. The price of the 40 pound board is more than that of the 15 pound board, so there are many factors to consider when choosing the type of material that you wish to use.



This is the 40 pound precision board after it was milled. No sanding has been done to this piece. This precision board milled very well. It is a considerably denser material than the 15 pound sign board, and the quality of the piece is much nicer at this point.

Steps used to finish the 40 pound precision board.

1. Edge sand the sample piece to remove any loose material from the milling process.
2. Spray the primer. Evercoat Dura Build was used in this example.



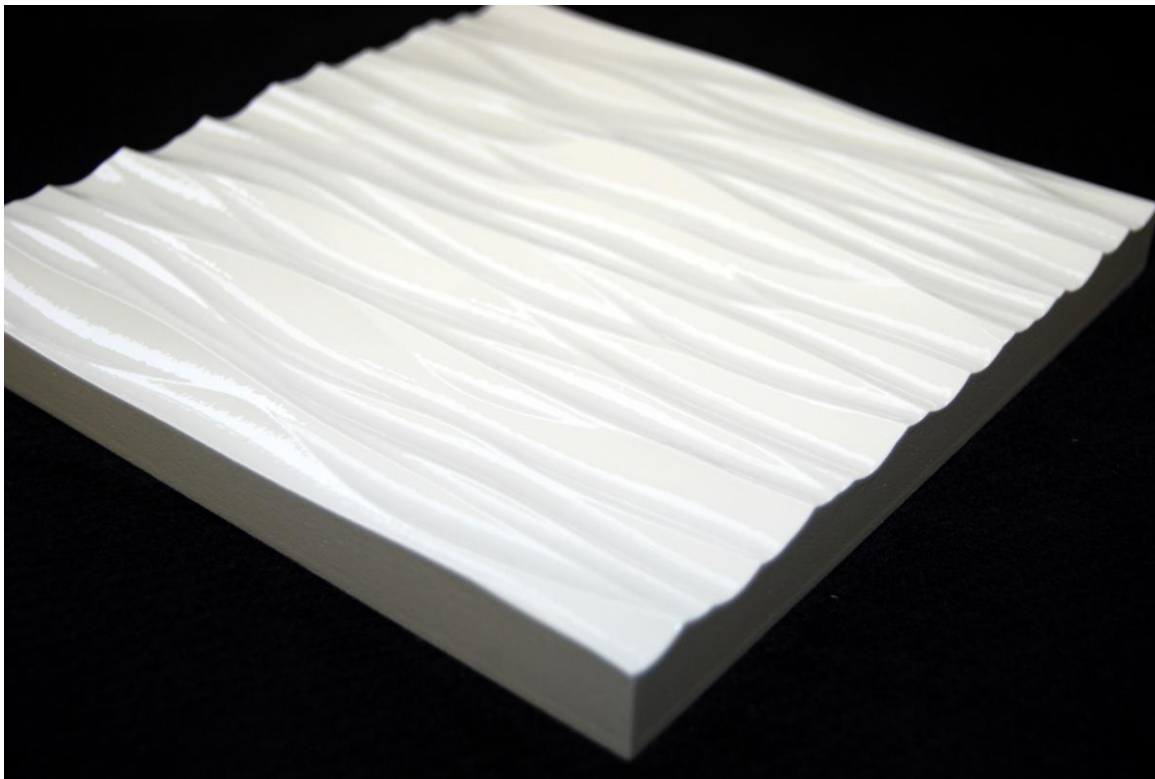
At this point very little hand sanding is suggested. The primer coat is not yet thick enough and it is not worth the risk of going through the primer to the precision board below.

3. Hand sand only noticeable splatters or fuzziness and spray a second coat of the primer.



The cells in the precision board have been filled in to create a smooth surface.

4. Hand sand and spray the paint. There were three coats of paint applied to this sample.



The 40 pound Precision Board had the nicest finish out of all of the HDU pieces that were tested. Starting with a more dense material gives the finish a smoother look.

Solid Wood

The rapid texture tool can also be used to add a texture to a solid piece of natural wood. When choosing the wood for a textured surface, there are things to consider. The pattern of the wood itself, you wouldn't want to choose a wood with a lot of busy grain because it may detract from the texture that you are trying to showcase. You may not want to use a very hard wood because it could take longer to mill and it is tough on the tools. You would want to choose a wood that does not easily chip and mills to relatively smooth surface without a lot of sanding required.

Cherry

In this example, we have chosen to use what our local wood supplier calls "Rustic Cherry". This wood does have a few knots through-out the wood. But we have found that the Rustic Cherry really does mill very well. It comes right off the table with a relatively smooth finish and not a lot of chips or tool marks. This is a picture of the cherry piece taken after is has been milled and before any sanding has been done. We will demonstrate the finish first with a spray lacquer and second with a polyurethane finish brushed on with a paint brush.



Cherry Example 1

Sprayed Lacquer

We have found that by far a sprayed lacquer finish can be a most desirable finish to use when working with wood. The lacquer gives wood a rich and smooth finish. By applying the lacquer with a spray gun, the application is quick and consistent. The dry time for lacquer is considerably shorter than waiting for polyurethane to dry.



1. Hand sand the wood and spray with lacquer.
2. This step is repeated for a total of 3 times.

This finish has a very nice look to it. There was little sanding that needed to be done in between coats of lacquer. We did not show the piece between the coats because the slight difference did not show well in the photograph. The lacquer is very fast drying. This allows you to get a nice finish on your project without wasting a lot of time waiting for it to dry. The 3 coats give the piece a nice build up of lacquer and the finish is very rich looking.

Cherry Example 2

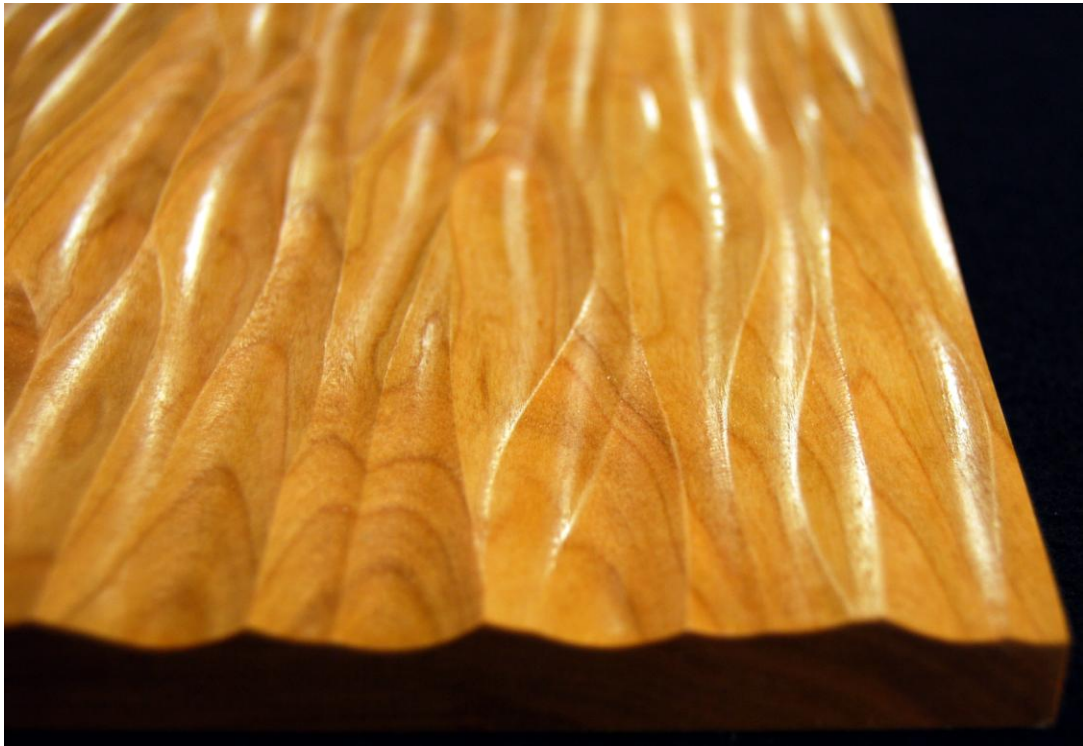
Brushed polyurethane Satin Polyurethane

For those who are not able to spray lacquer, this finish can also achieve a very nice, consistent and rich looking finish. The drawback with brushing the polyurethane is the time that it takes to dry and the risk of brush marks in the finish. With practice, you can work to get good at applying the polyurethane so that you do not see any brush marks in the finish, but the time it takes to dry will still be longer than the lacquer finish.



Steps to finish this example of the Cherry Wood:

1. In this example, we hand sanded the cherry piece and then the polyurethane was brushed on. There is considerable dry time in between the coats. The picture above was taken after the first coat of polyurethane and before any sanding was done. It feels rather rough and it seems to have soaked into the wood quite a bit. We will hand sand this piece again and then brush on the second coat of polyurethane.



2. After the second coat of polyurethane the finish is getting smoother. Next sand the piece again and apply the final coat of polyurethane.

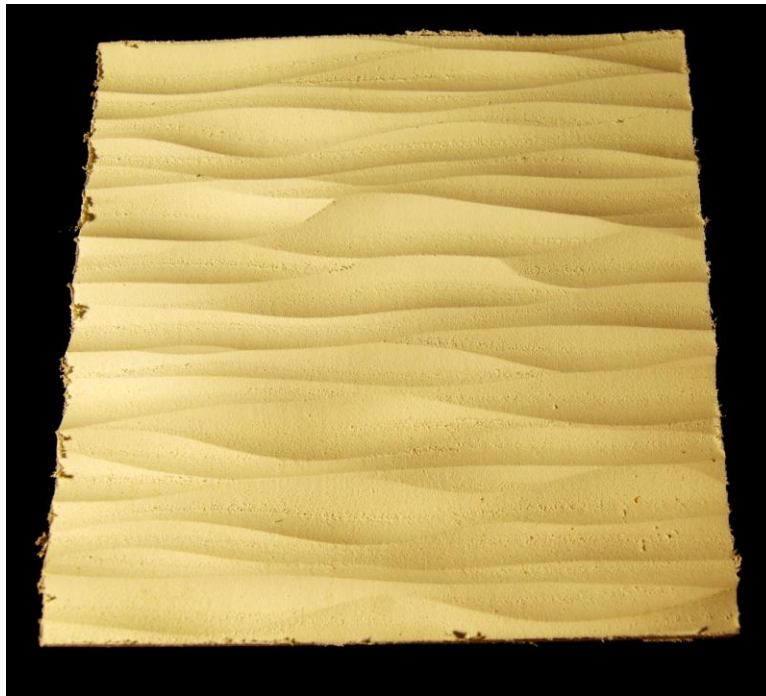


The final coat of polyurethane gives the piece a very nice finish. Just be sure to avoid any drips or runs when applying. The finish for this piece included a lot of dry time and it is important to have a relatively dust free environment in order to attain a smooth finish.

PVC

Polyvinylchloride Sheet (PVC) is a chemically foamed, rigid, light weight extruded sheet with fine closed cell structure having a smooth matt surface finish on both sides. It is consistently colored with a matte finish that is strong and multipurpose enough for many of today's applications. It is excellent for outdoor exposure and is paintable and weather resistant.

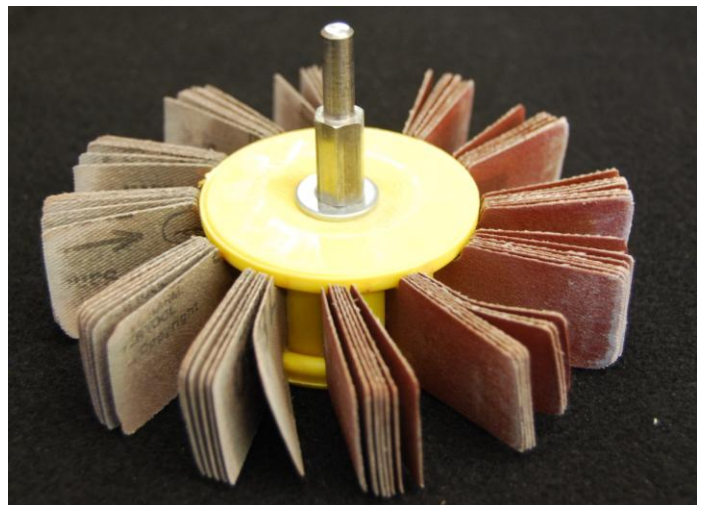
The PVC piece is a bit rough after milling. The finish is not nearly as smooth as any of the other types of material that we have used in this tutorial. We will demonstrate three different approaches to finishing this material.



Example 1 of the PVC

Spray primer and sand with a flap sander

With the use of a flap sander, we were trying to find a way to shorten time spent sanding and still get a consistent smooth finish. We found that this particular flap sander was not a very efficient tool to use. It was difficult to get into all of the areas of the texture with this tool. The finish that we achieved was an ok finish, but it may not have been worth the time and effort it took to get it.



1. Using a small flap sander attached to a power drill we sanded the surface and edges of this piece. The sample piece is a small piece, so the flap sander was able to reach all of the areas of the piece easily. This flap sander worked ok on this piece, but it would take considerable time if used on a larger piece.
2. Spray the Evercoat primer.



The texture of the piece is still rough. You can still see some fuzziness and tool marks. The primer coat is not yet thick enough to use the flap sander without risk of removing all of the primer down to the pvc. The next coat of primer will be applied.



After the second coat the surface is starting to fill in to create a smooth surface.

3. Use the flap sander to sand the finish and then spray the third coat of primer. You will notice that the surface is filling in and becoming more consistent and smooth.



4. Spray the paint.





After three coats of paint the surface turns out just a little textured. It turned out very well considering the shape that the PVC was in after it was milled. The roughness of the piece was covered very well with the primer and then the paint.

Example 2 of the PVC

Spraying primer and paint and sanding with the dynabrade tool.

Once again we were trying to find a solution to the sanding of textured surfaces. Using the Dynabrade tool with the sanding stars was a good solution. It was able to quickly sand a large uneven area and allow us to achieve a smooth finish.

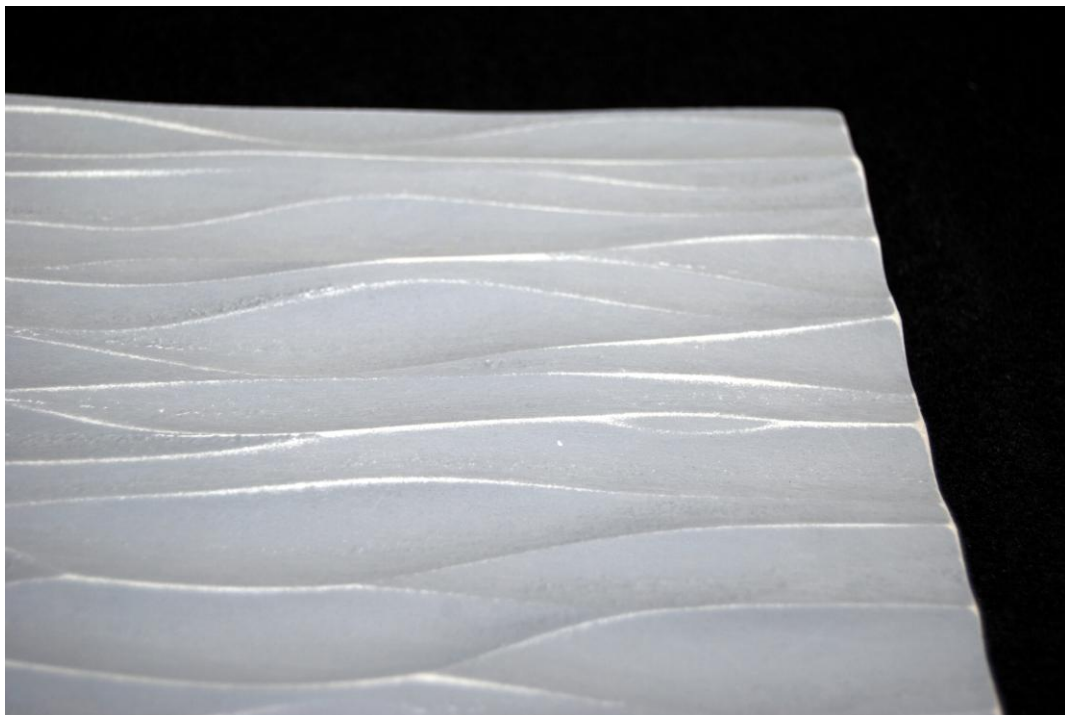
The Dynabrade tool is an air powered tool used for sanding. With the sanding star attachment it works well with textured materials to quickly sand the uneven surface.



1. Sand the edge and lightly sand the pvc sample piece to remove all loose pieces of the pvc.
2. Spray Evercoat primer.



After the first coat of primer, the texture of the piece is still rough. You can still see some fuzziness and tool marks. The primer coat is not yet thick enough to create a smooth finish.



3. After the first coat of primer was sprayed on the sample piece, it was still very rough. The Dynabrade tool with the sanding stars attachment was used to sand the piece. It was considerably smoother after gently using the sanding tool with 150 sanding star. The sanding process did remove the primer from the high points in the texture.
4. Spray the next coat of primer.



The surface is more consistent after the second coat of primer. Use the Dynabrade tool to sand gently and then spray the paint to finish.

5. Spray paint to finish. There are three coats applied to this sample.

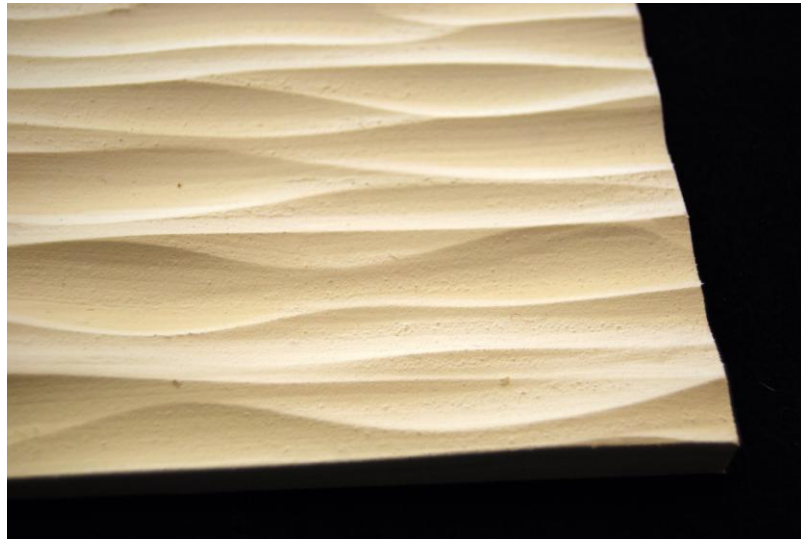


There is just a little texture in the finish. The DynaBrade tool with the sanding stars worked very well with the PVC. It created a smoother finish with each step and the tool was much quicker than hand sanding.

Example 3 of the PVC

Brushed Primer and paint with very little sanding

This example used the FSC-88 WB primer. We wanted to see how it would work with the roughness of the pvc with little sanding done between coats. We did find that we could achieve a relatively smooth surface by using care when brushing on the primer and the paint. You can still see brush marks in the finish, but the roughness of the pvc did not show.



1. Brush on first coat of primer. With this example the Coastal FSC-88 was used. The picture above shows the first coat. You will notice that it is the finish is still quite rough. Part of that is from the piece itself and part of it is from the first coat of prime. According to the Coastal Enterprises finishing instructions, we will brush on an additional coat of primer to build up the surface.
2. Brush on the second coat of primer.



After the second coat of primer there is still visible roughness to the piece. A light sanding will

be done and then another coat of primer will be applied.



You can see that this has created a smoother finish. Some brush marks are still visible, but in general the piece is getting smooth.

3. Lightly sand the piece and then brush on a coat of paint.



The finish shows brush marks and some imperfections from the primer. It is not a bad finish considering how rough the piece was to start with, and the fact that very little time was spend

sanding.

MDF

Medium Density Fiber Board is an engineered wood product formed by breaking down hardwood or softwood residuals into wood fibers, combining it with wax and a resin binder, and forming panels by applying high temperature and pressure. MDF is much stronger and denser than plywood. MDF is a good choice to use with the rapid texture tool. This picture was taken after it was milled. You can see that the texture of the piece is very good and not a lot of sanding is needed before applying the primer coats.



Example 1 - MDF:

Spray Primer sand with Scotch Brite Pad

This example demonstrates the benefits of the scotch brite pad to sand a textured project. It is flexible enough to reach all areas of the textured surface with not a lot of effort. The finish does show a little texture, but for large projects it would be something to consider saving time with the sanding.

1. Sand the edge of the sample piece with a Scotch Brite pad.



2. Spray primer. The Evercoat Durabuild was applied to this sample.



After the first coat of primer, the surface of the MDF appears rough and fuzzy. The primer seems to have soaked into the MDF quite a bit.

3. Sand with a scotch brite pad to smooth. Spray on the second coat of primer.



You will notice that the finish has become considerably smoother. There are still a few rough places on the sample piece. Sand with the scotch brite pad to smooth.

4. The scotch brite does a nice job of smoothing the surface. One more coat of primer will give this an even smoother look.



5. The third coat of primer creates a very smooth surface. At this point, the piece just needs a quick sanding with the scotch brite pad and then it is ready for paint.



6. Spray paint to finish.



This method worked very well with the MDF. The surface is just slightly textured. The general appearance is smooth and consistent. The scotch brite pad allowed the sanding to be completed quickly by hand because the flexibility of the pad allowed you to reach the low points of the texture easily.

Example 2 - MDF:

Spray Primer and hand sand between coats

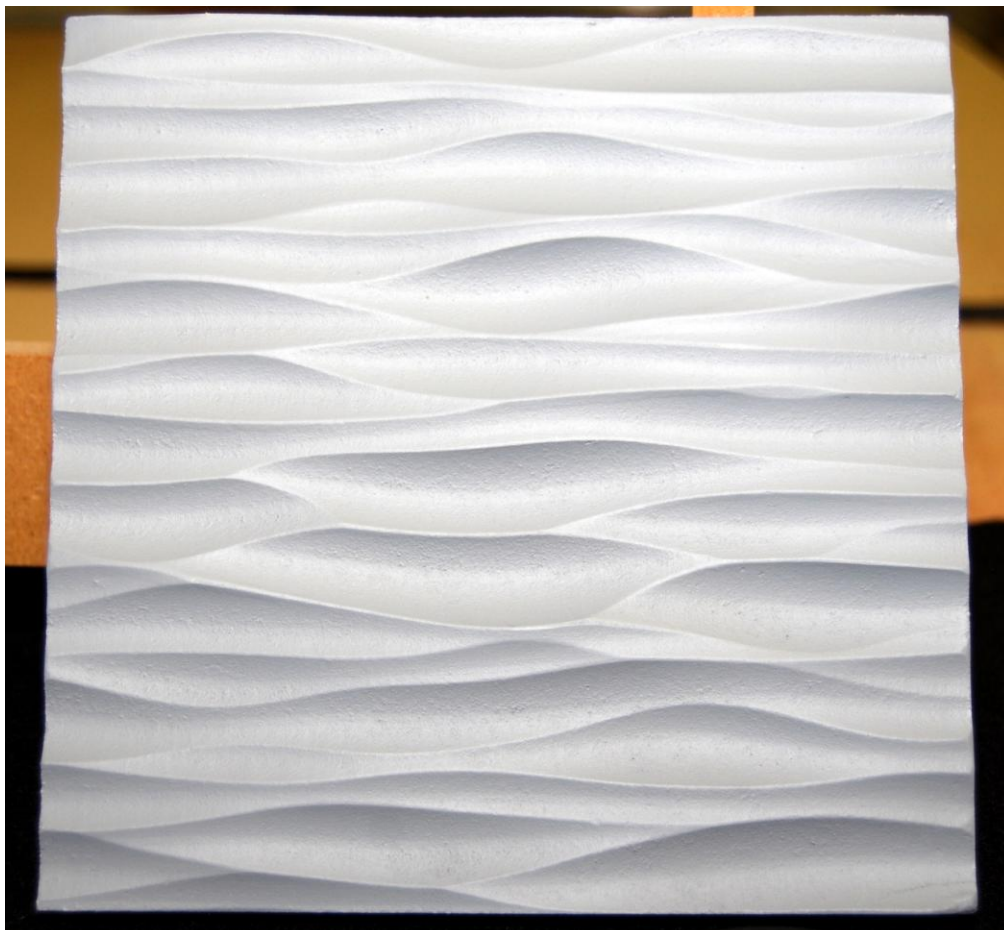
The finished surface with this method can be made to look very smooth. You just need to decide how much time and effort you want to spend sanding. It can be difficult to reach all of the areas of a textured surface with sand paper.

1. The MDF piece mills quite well so only light sanding is needed to prepare the surface for the primer. Spray the primer. The Durabuild primer was used on this sample.



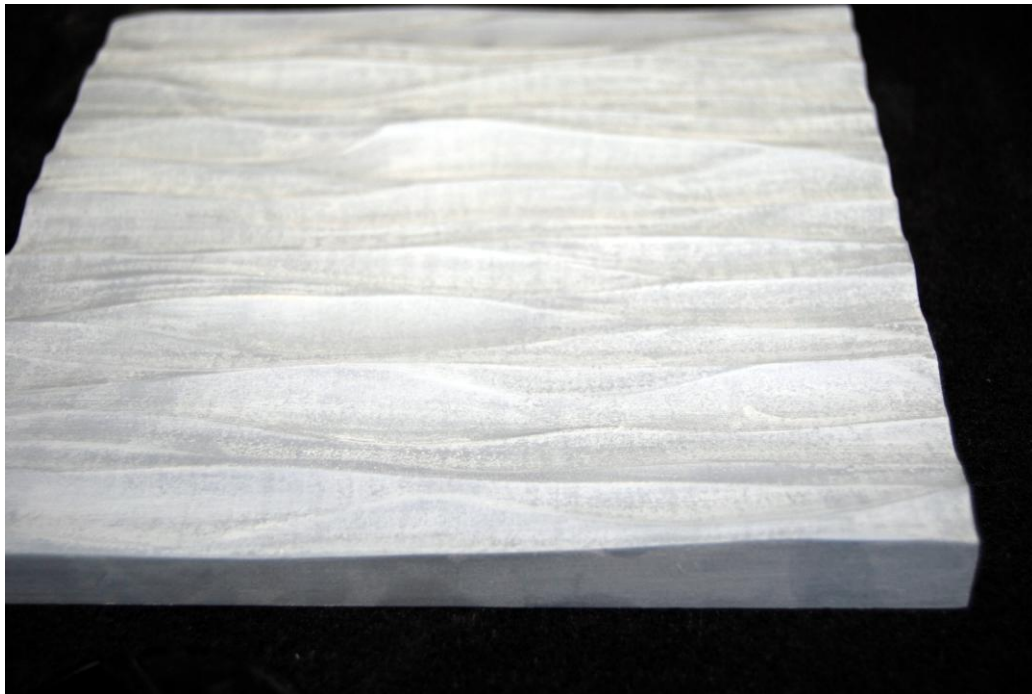
The first coat of primer does raise some fuzziness on the mdf. Hand sand the finish lightly to remove the roughness.

2. Spray the second coat of primer.





After the second coat of primer is applied, the surface does become more consistent. There are still areas that are not as smooth finish. Hand sand the piece to smooth out the primer.



3. The picture above shows the piece after hand sanding. It is starting to fill in and smooth out. Spray one more coat of primer.



4. Spray the paint to finish.





The surface is smooth and consistent. It is a very nice finish. The surface of this sample is just a little bit smoother than the surface using the scotch brite pad. It took considerably longer to sand the primer surfaces with sand paper by hand than it did using the scotch brite pad. In the end, it may not be worth the extra time to hand sand as the finishes looked so similar.

Example 3 - MDF:

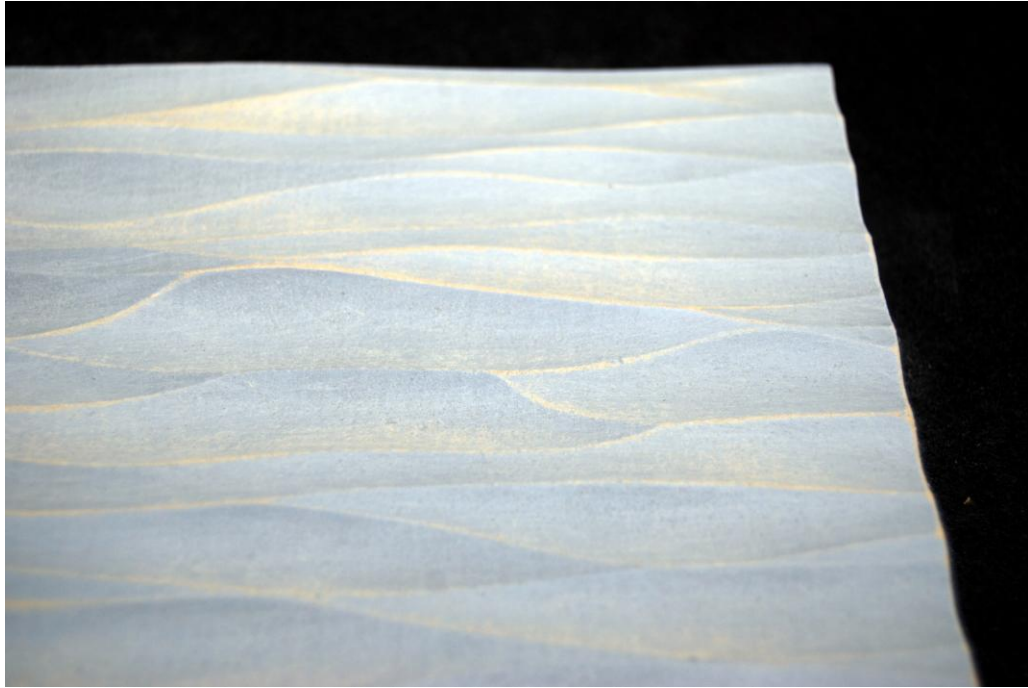
Spray Primer and use Dynabrade tool to sand surface.

Using the Dynabrade tool to sand this sample saved time and created a very smooth finish without a lot of time and effort.

1. The MDF was smooth when it came off of the machine. It was sanded with the dynabrade tool. This tool cleaned up any roughness or loose material very quickly.
2. The Durabuild Primer was sprayed on the sample piece.



3. Sand the piece with the Dynabrade tool.



You can see that the dynabrade tool has done a very nice job of smoothing out the mdf. A 150 grit sanding star was used and attention was paid to use the tool gently so has to not remove all of the primer.

4. Spray the second coat of primer.



The second coat of primer leaves the surface well covered and mostly smooth. Use the

dynabrade tool gently and then apply the paint.

5. Spray the paint.



The surface is smooth and consistent after 3 coats of paint. The dynabrade tool with the sanding stars made quick work of the sanding and did a very nice job of smoothing the surface.

Example 4 – MDF

Spray Primer and use a flap sander between coats.

We wanted to determine if the flap sander was a more efficient way to sand the MDF. We found that this particular flap sander was somewhat difficult to use. We were able to achieve an ok finish, but it may not be worth the effort and time that it took.

1. Sand the sample piece with the flap sander.
2. Spray the primer. The Durabuild primer was used in this example.



You can see that the surface of the sample has become a bit rough and fuzzy.

3. Sand the piece with the flap sander. The flap sander did go through the primer to the surface of the MDF in places. Care must be taken because ultimately, you do not want to remove all of the primer that you just applied. Apply the second coat of the primer.
4. After the second coat of primer the surface has a nice coat of primer and is becoming smooth.



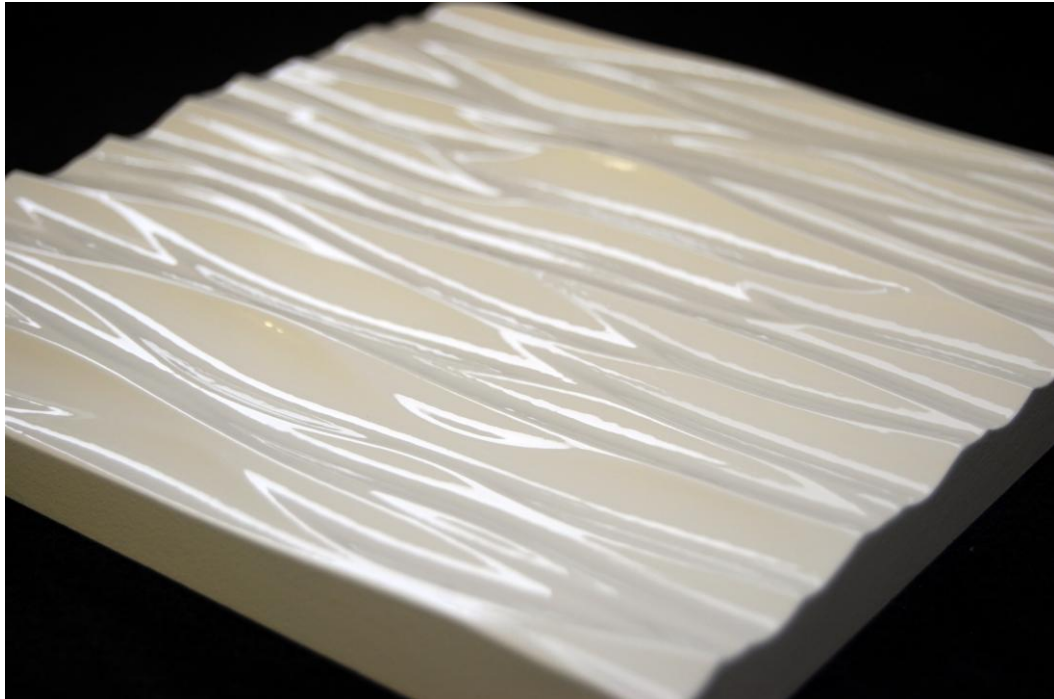
Use the flap sander once again to smooth the primer. It is easy to go through the primer to the MDF with the flap sander at the top edges or the high points. At the same time it is difficult to reach the lower portions of the texture with the flap sander.

5. Spray the third coat of primer.



The surface is smooth. It is ready to gently use the flap sander to get the surface ready for the paint.

6. Spray the paint.



The surface has a little "orange peel" texture to it. We found that the flap sander did not improve the sanding experience.

Larger MDF Examples:

We have also included two larger pieces of MDF so that we can demonstrate finishing the surface like you may paint a wall. It is sometimes hard to get a good idea with smaller pieces about how the finish will look.

Example 5 – MDF

Brush Kilz Primer, Brush Satin Latex Paint

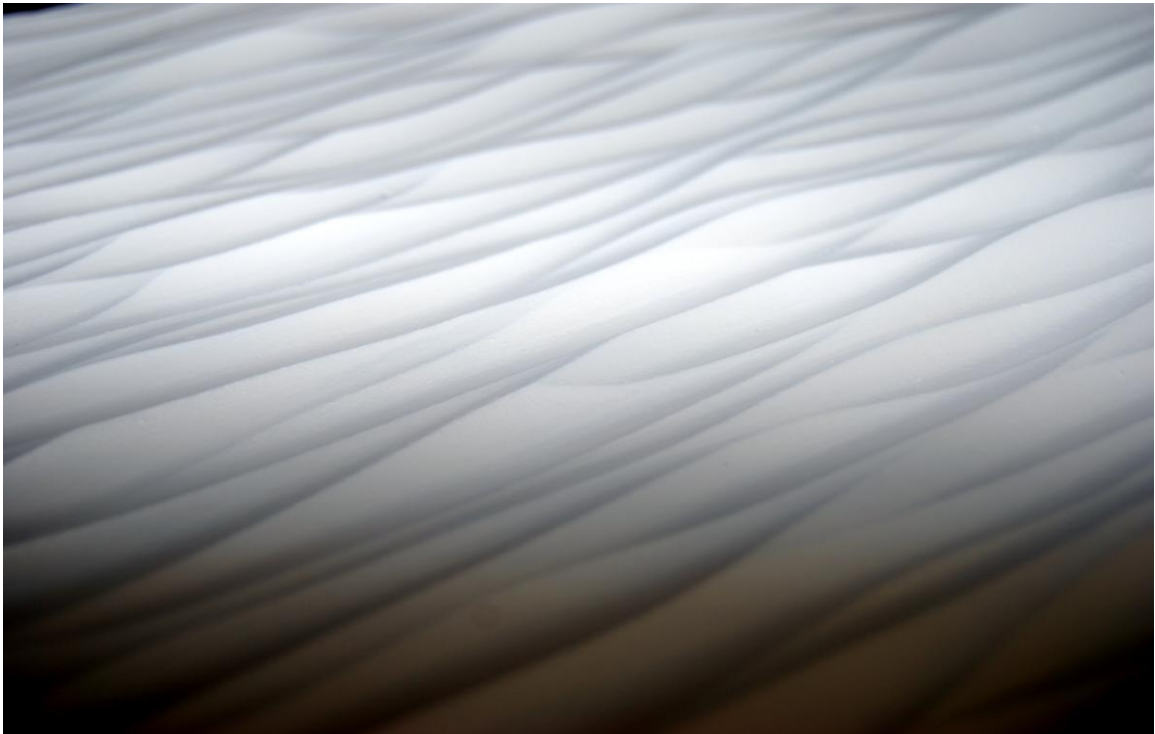
With the example we were demonstrating how the finish would look if you have an entire wall area that has been textured. We used Kilz primer and a Latex paint to get a finish that looks like that of a painted wall using a paint brush.

1. Sand the edge of the piece to remove any loose particles from the milling process.
2. Paint the surface with Kilz primer using a brush.



You can see from this close-up shot that the primer does go on smoothly with a brush. It is still rough to the touch and some brush marks can be seen. The piece will get a light sanding and then it will be painted.

3. Latex Satin paint was applied with a brush.



The surface is covered nicely. The brush stokes show just slightly.

4. Brush on a second coat of paint.





The second coat of paint helps to give the finish a smoother look. You can still see a bit of roughness up close. The finish is not like a spray finish, but it is still very nice.

Example 6 – MDF

Roll Primer and Paint

With this example, the finish is painted on with a paint roller. You do need to take care to use a roller with a thick enough nap to reach all areas of the texture. The primer and paint rolls on well, but the finish does reflect the texture of the roller in the paint.

1. Sand the edge of the piece to remove any loose particles from the milling process.
2. Paint the surface of the piece with Kilz primer using a paint roller.

The next picture was taken after the primer was applied with a paint roller. We found that it was difficult to get a good coverage using the roller and some of the surface did not get covered. It is possible that we would get better coverage using a much thicker nap roller than the standard nap. The texture of the piece reflected the use of the roller also. Using a brush to apply the primer made the finish a lot smoother than the roller.



3. Paint the surface with Semi-Gloss Latex paint using a roller.



A $\frac{3}{4}$ inch roller was used to apply the paint. The thickness of the roller did help a lot to reach all of the areas of the texture to create a consistent coat of paint on the surface of the sample piece. The roller does leave a texture in the paint.

4. A second coat of paint was applied with the roller.



You can see that there is a sort of orange peel texture to the paint. This is from the roller. Overall, this was a quick and easy way to finish this piece.

We hope that this study on finishing different types of surfaces helps you to find a method that works for you.