

Hotfix with Stitch Era

Rough Draft

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Overview and hardware

Hotfix stone

Introduction

Hotfix or (hotfix stones) are decorations like rhinestones, rhinestuds, nailheads, etc. that can be glued on textiles or other materials by heating them. This article introduces rhinestones (i.e. flatback hotfix stones), includes a size table and explains how to apply hotfix stones to textiles using templates.

See also:

- Stitch Era - creating hot fix designs
- Stitch Era - creating embroidery with hot fix stones
- Heat press and Ricoo T538B heat press

“Flatback crystals which are often called rhinestones have a faceted face one side and a flatback on the opposite side usually with a foiled backing. They are available in a range of materials the cheapest being acrylic and the highest quality and most expensive Swarovski Crystal. They come in a range of shapes and sizes the most popular of which being the circular flatback you can see above which are used for crystallizing such things as nails, lips, clothing, footwear, statues, artwork, gadgets and much more...” (Guide to Using Flatback Crystals ^[2] (Oct 2, 2017).



Source: Sequin Pattern 2 ^[1]

According to Wikipedia ^[3], “Hot fix rhinestones, also called heat transfer rhinestones, are mainly used for apparel. The flat bottom of the stone has a glue backing and when heated melts onto the surface of the clothing. These can be adhered using a regular iron, however, it is recommended to use a heat press, as they are able to reach higher temperatures (standard transfers require temperatures of up to 180–200 °C (350–400 °F), which regular irons are not capable of) while applying heavy pressures resulting in a more professional standard quality.” (Oct 2, 2017).

Hotfix stone sizes and quality

An introduction to rhinestone size

Rhinestones size are either defined with "ss" (stone size) or pp (pearl plate). PP is a more precise measure.

According to Guide to Using Flatback Crystals ^[2] (Oct. 2017), as general guide, the following sizes are used:

- ss3 – ss7 : Nail art (7 being the more popular size)
- ss8 – ss10 : Generally used for filler crystals, tiny objects or creating intricate artwork with crystals in conjunction with other crystal sizes.
- ss12 – ss20 : Footwear, clothing or accessorizing gadgets.
- ss30 – ss48 : Clothing especially dance costumes to add some sparkle.

According to Creative Crystal ^[4], customers, prefer 4mm (16ss), 3mm (10ss) and 7mm (34ss) in that order. Working with SS16 allows for fairly good filled lettering or other details and manipulating these is not too much of a pain. Working with small SS10 stones is a real pain ! I suggest that beginners should start with SS20 (4.6 to 4.8mm depending on the make) or bigger. Below a picture of brushing SS16 stones into a template.



Brushing SS16 stones into a template

The procedure for computing the rough amount of stones needed:

- Compute the surface in mm: width X length if you have a square
- Select the stone size in mm
- Divide surface / stone_size

Example: A filled circle of 10 cm (that is quite a lot !) to filled with stones that have a width (diameter) of 5mm.

- Surface of circle formula: $\text{radius}^2 * \text{PI}$
- Surface: $3.14 * 50^2 = 7854 \text{ mm}^2$
- SS22 surface: $5^2 = 25 \text{ mm}^2$
- Stones needed: $7850 / 25 = 314$

Size table

The following table includes approximate rounded mm values. Various source on the Internet include contradictory information. **Do not trust these values**, verify with other sources please. Also, different manufacturers, may use somewhat different sizes. Sizes in bold are supported by the Hotfix Era software. Sizes of 6, 10, 16, 20, 30, 34 and 40 can be easily found with online retailers such as AliExpress or Amazon.

The table below includes typical width and height. We also will try to add information about time needed in the heat press at 200C and tolerable thickness of template materials. Time for heating is probably dependant on both the tissue and the make of the stone.

ss	pp	ø mm	ø Svarovski	Typical Height mm	Heat press time (provisional)	Template thickness (provisional)
000	1	0.8 - 0.9				
00	2	0.9 - 1				
0	3	1.0 - 1.1				
1	4	1.1 - 1.2				
2	5	1.2 - 1.3				
2½	6	1.3 - 1.35				
3	7	1.35 - 1.4	1.4			
3½	8	1.4 - 1.5				
4	9	1.5 - 1.6	1.6			
4½	10	1.6 - 1.7				
5	11	1.7 - 1.8	1.8			
5½	12	1.8 - 1.9				
6	13	1.9 - 2.0	2.0			
6½	14	2.0 - 2.1				
7	15	2.1 - 2.2	2.2			
7½	16	2.2 - 2.3				
8	17	2.3 - 2.4	2.4			
8½	18	2.4 - 2.5				
9	19	2.5 - 2.6	2.6			
9½	20	2.6 - 2.7				
10	21	2.7 - 2.8	3.0	1.4		
11	22	2.8 - 2.9				
11½	23	2.9 - 3.0				
12	24	3.0 - 3.2	3.2			
13	25	3.2 - 3.3				
13½	26	3.3 - 3.4				
14	27	3.4 - 3.5	3.5			
14½	28	3.5 - 3.6				
15	29	3.6 - 3.7				
15½	30	3.7 - 3.8				
16	31	3.8 - 4.0	4.0	1.5	20s	0.5 to 1 mm

17	32	4.0 - 4.2				
17½	33	4.1 - 4.2				
18	34	4.3 - 4.4				
18½	35	4.5				
19	36	4.5 - 4.6				
19½	37	4.5				
20	-	4.6 - 4.8	4.8	2		
21	-	4.8 - 4.9				
22	-	4.9 - 5.0				
23	-	5.0 - 5.2				
24	-	5.2 - 5.4				
25	-	5.4 - 5.6				
26	-	5.6 - 5.8				
27	-	5.8 - 6.0				
28	-	6.0 - 6.2				
29	-	6.2 - 6.4				
30	-	6.4 - 6.6	6.5			
31	-	6.6 - 6.8				
32	-	6.8 - 7.0				
33	-	7.0 - 7.2				
34	-	7.2 - 7.4	7.0	3	30s	
35	-	7.4 - 7.6				
36	-	7.6 - 7.8				
37	-	7.8 - 8.0				
38	-	8.0 - 8.2				
39	-	8.2 - 8.4				
40	-	8.4 - 8.7	8.5			
41	-	8.7 - 9.1				
42	-	9.1 - 9.5				
43	-	9.5 - 9.8				
44	-	9.8 - 10.1				
45	-	10.1 - 10.5				
48	-	10.9 - 11.3	11			
50	-	11.7 - 12.0				
60	-	14.2 - 14.5				
63	-	15.0 - 15.2				
70	-	16.7 - 17.0				
80	-	19.2 - 17.5				
83	-	20.0 - 20.2				

Quality

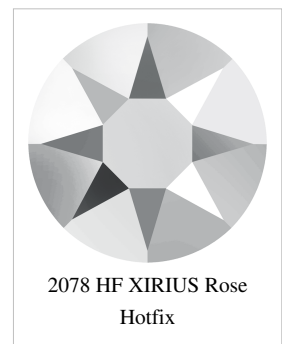
Hotfix Rhinestones come in several varieties and qualities. From our little experience we can see different quality dimensions:

- Quality of glue
- Quality of cut (even)
- Number of faces / cuts
- Foiling (backing): silver, aluminium, lead, etc.)
- Stone assembly: stone + metal sheet + glue
- Form: Regular or irregular. Do the sizes (radius, height) match ? Are the stones really round ?
- Overall vs. total quality. Lower quality sets may have bad stones inside.
- Contains no lead (required in principle for children's wear).
- Glue: It should stick and be washable.

Generally speaking, a good rhinestone should sparkle from all angles, have the regular and same dimensions, and stick to the fabric.

Below are a few recommendations that summarize information that is circulating on line

- Swarovski ^[5] Rhinestones are made in Austria and seem to have the best quality in any color. There are several models. A well known type is the XIRIUS Rose Hotfix 2078 HF which has 16 cuts (8 large and 8 smaller ones plus the one on top).
 - 100 4mm (SS 16) can cost between 5 and 20 Euros on Amazon.fr
 - 1440 SS16 can cost 55 Euros.
- Preciosa ^[6] Rhinestones are made in Czech Republic and are cheaper than Swarovski stones. Quality seems to be almost the same for similar models. SS16 are available with 12 faces (MC Chaton Rose VIVA12 line) or 8 faces (Chaton Rose MAXIMA(8F)). More complex stones also exist for larger sizes. Below are a few randomly collected prices.
 - 350 SS16 cost 5 Euros on Amazon.fr.
 - 1440 SS16 can cost between 7.5 (discount) and 55 Euros. A typical price is 36 Euros for a SS 16 Chaton Rose VIVA12
- DMC rhinestone (Diamant Machine Cut) is a Korean rhinestone company that produces comparatively high quality, but much cheaper than Swarovski. Stones have 12 faces.
 - E.g. 1000 SS 16 can cost 10 Euros. On AliExpress I have seen offers for 1440 pieces at \$5.



One should distinguish between the original Korean DMC's and the ones that are produced in China. Often, "DMC" does not stand for a brand, but is an indicator of decent quality.

- Blue Nil is another good brand
 - 1440 SS16 can cost about 30 Euros
- No name brands can offer suitable quality and they can cost 10 times less than the top Swarovski brand. But there is no guarantee that sizes are even, workmanship is good enough and glue will stick. Enquire before you buy or else keep at least track of the ones you did like.

Software

Embroidery software

Stitch Era includes an optional module for hotfix designs. It can output design stencils or templates that can be printed with different laser and vinyl cutters.

The software allows drawing shapes that then can be filled with slots for stones according to several parameters.

Online auxiliary tools

(to do)

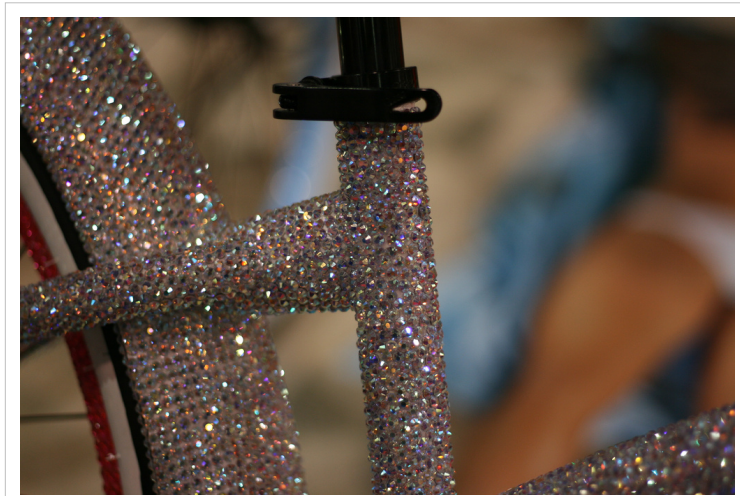
Materials suitable for hotfix

Hotfix stones can be applied to variety of textiles and other materials. According to Understanding Hotfix ^[7] by Harman, hotfix rhinestones should only be used when the material it is being applied to has all of the following attributes:

1. Heat resistant (min of 250°F/ 120°C)
(e.g most plastics are not heat resistant)
2. Resistant against pressure
3. Porous/Absorbent - it does have any waterproof or other coating that would make it non porous. The water drop test is a quick and easy way to get an initial idea of the absorbency of the carrier

material. Apply a couple of water drops onto the carrier material. If the material quickly absorbs the drops, it offers good absorbency. If the water pearls off the carrier material, or if it takes a long time to be absorbed, the material offers insufficient absorbency.

They also provide a list of unsuitable fabrics, e.g. very tightly woven textiles, extremely thin fabrics, smooth leather and smooth imitation leather and water repellant treated materials.



Hotfix stones on non-textiles

Applying hotfix stones

To position hotfix stones, it is best to use a template made with a laser or a vinyl cutter. The template allows positioning of the stones. If you use an iron or a heat press, you can keep the template in place. However, make sure that it is heat resistant, e.g. in particular never use vinyl with PCB inside since burned vinyl releases very dangerous combat gas !

Principle

Hotfix stones can be fixed with different methods. All of them are defined by four parameters

- Amount of heat depends on the maker. E.g. Swarovski has a range of 120 °C to 170 °
- Time: E.g. max. 20 seconds for 160 °C and 60 seconds for 120 °C when applied from the front.
- Pressure: A certain amount of pressure must be applied but not too much since otherwise the glue will spread out. Also if you use an applicator the stone can either get stuck in the opening or not stick, i.e. you will have to find a good compromise.

- Side of application (from top or from underneath)

Both time and heat parameters are highly connected. Higher temperature requires less time.

Before using any tool / textile / stone combination for real, do a test !!

Hardware for hotstone application

Probably the best bet for a beginner is to start using a cheap hotfix applicator. Presses are fairly expensive and working with an iron is a bit more tricky.

As a general rule:

- position the fabric on a surface that is heat resistant, e.g. a sheet of metal or a heat-resistant cutting mat
- separate layers of fabric underneath with baking paper, else they may be glued together
- Make sure to heat enough (at least 120 degrees and make sure that the textile will not melt, i.e. **do not use plastics**)

Hotfix applicators

Hotfix applicators are cheap devices that look a bit like a soldering iron. They allow heating a hotfix stone one by one. It includes removable ends that will adapt to various hotfix forms. Better ones can aspire the stones. A cheap application costs about 10 Euros. One that includes a vacuum mechanism is about 100.-

There are two variants:

- Grab a stone from the top. If you are lucky it should stick, then let it heat. As soon as the glue softens or boils, press it down a few seconds.
- Put the stone on the textile. Then then press the hot applicator down.

In both cases, you can apply a *very* slight rotational movement to make sure that each part sticks. But do not move the stone and do not apply too much pressure.

Iron without holes

A simple iron (without holes) also can do, heat it to 150°C (that is position 2 on a normal iron). Put cardboard or baking paper underneath the cloth and then put either some baking paper or a flat kitchen towel in between the iron and the stones. Alternatively you can buy more professional fabrics, e.g. teflon-based instead of baking paper. Press it down for about 30 seconds for stronger fabrics.

Heat Press

A heat press or transfer press (presse à chaleur, Hitzepresse, Transferpresse) can glue a whole set. Heat presses also can be used to transfer other materials, in particular cut out heat resistant plastics and textiles. A good beginner's machine can cost 400 to 500 Euros, but one can find \$200.- models on sale. High end models can cost from 1500.- to 2000.- There are a huge amount of various makers and vendors. Most do not include information about suitability for hot stone application. See below for more details.

Ultrasonic devices

This looks an applicator but works with ultrasonic fiction as opposed to a heated end. More expensive. It allows to pick up a stone.

Stone setting machines

Used in mass fabrication. Stones are placed and heated with a machine.

Templates for hotfix

Templates are based on drawings that show position for each stone, typically with a circle. Hot fix software, like Hotfix Era eases the design process.

There are two ways of using templates:

- Cut out the template with a laser cutter or a cutting plotter. Glue a sheet of something (e.g. thick paper) underneath. Then fill the template with rhinestones. Transfer the stones to a textile using a transfer sheet. Thickness of template should be 0.5mm for smaller stones, but it can be higher for larger stones (e.g. SS16 and SS24).
- Print a page with the design. On top, put transfer paper, sticky side up. Then manually put the stones upside down (flat side up) on the sticky paper. Then transfer as above on top of a cloth.

The procedure of creating a template with the help of specialized software and some post-processing of the SVG output is explained more in detail in the [Stitch Era - creating hot fix designs](#) article.

Fabrication with a template, transfer paper and a heat press

This section shortly explains how to apply hotfix stones with a heat press, positioning the stones with a template and then transferring it to a heat press. The principle can also be used with a hot iron.

Heat transfer press specifications

Your heat press (we believe) should have the following specification.

- It should either have a large opening **or** a lateral swivel swing (Schwenkarm) **or** a drawer style lower plateau. A swivel press is probably best if you plan to improvise a bit since it allows positioning things without hindrance from the top.
- It should provide an even distribution of pressure and temperature
- It should auto-adjust pressure to uneven textiles, e.g. with springs on top of the heating plate and a somewhat flexible mat.
- I must allow height/pressure adjustment, i.e. dealing with the somewhat larger height of hot stones by moving the heat plate up or down with a "pressure knob"
- It should have anti-sticking coating underneath the heating plate (e.g. teflon)
- 38 x 38cm size should be enough (15x 15)

If not furnished with the model, you must buy a silicon mat to put underneath. If the top is not coated you must either buy teflon sheet or else use baking paper. In any case, it is always good to put baking paper ^[8] (also called bakery paper or parchment paper) underneath the cloth and on top of the design. Do not use wax paper but as we said above there are more professional solutions like teflon sheets. Also, if you use the transfer method, you could take a teflon heat transfer sheet.

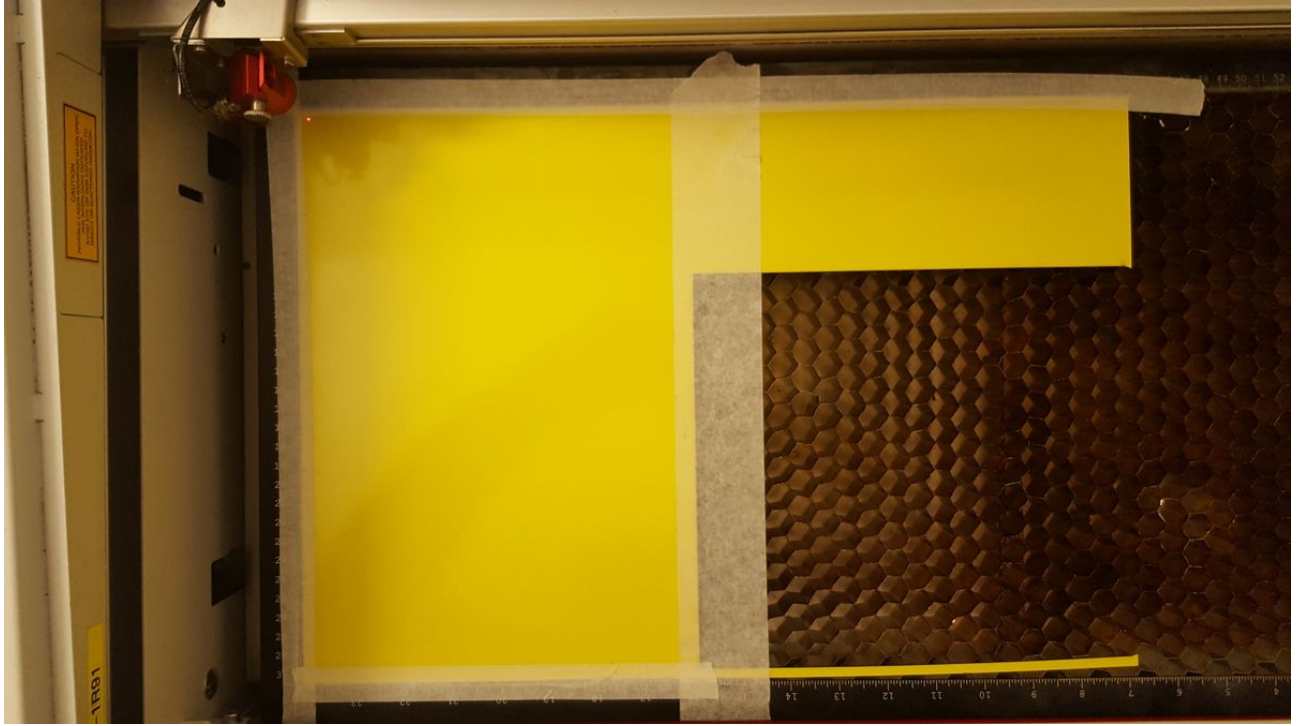
The usual procedure for design with **lots** of hot stones is the following

Step 1 - Create a template

Create a template, e.g. with some specialized software like Stitch Era that you can then print with a laser cutter or a vinyl cutter. There are two options if you use multiple colors and sizes. Either create a single template or one for each size/color combination. The latter may be easier for semi-industrial production, but I am not sure if heating the same stones several times because of multiple passages into the heat press is a good idea. If you use a single template, follow advice below on how to put the stones inside.

Search for "Rhinestone template material". I used both free compact cardboard and acrylic made for laser cutting. Cardboard is better for brushing but the transfer paper may stick to it and rip some paper away (which is not a big

problem). Acrylic is maybe a bit easier for the transfer, but it is more expensive. In addition, acrylic material (such as Trolase) will wrap in the laser cutter and the lens will be offset. Such a defocalised lens may not cut through the material, will take away more material, and can cause the material burn. Supervise the laser cutter when you work with light materials that can wrap (paper, cloth, thin acrylic, etc.). Anyhow, make sure to tape down the borders or weight them down with flat and heavy objects.



Tape down before cutting many little holes

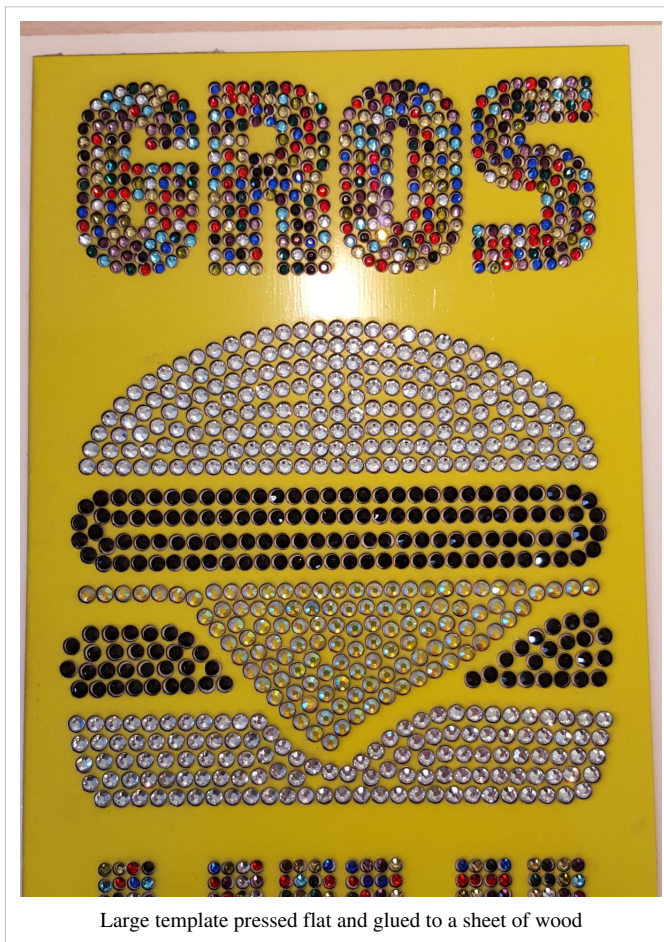
After cutting out the template, glue some thick paper to its bottom. This, in order to prevent the stones from falling through and gliding underneath. However, also read my own more simple method in the next section, i.e. putting the template on top of the cloth in the heatpress without doing any transfer. The latter method works rather fine for small templates that use SS16 stones and higher.

By default I suggest using 0.7 to 1mm thick materials for SS16 stones and larger. SS10 stones (1.4mm height) probably require less thickness than 1mm. Maybe thick paper could do. Otherwise try cardboard from single Malt Whiskey cases (between 0.6 and 0.7mm).



Glue some thick paper to the bottom of your templates

If the template is warped, something that can happen for larger designs or/and of the support material has different "sides", we suggest gluing it to a sheet of plywood or MDF and then putting into the (cold) heatpress to make it flat.



Large template pressed flat and glued to a sheet of wood

Step 2 - Brush the stones into the template

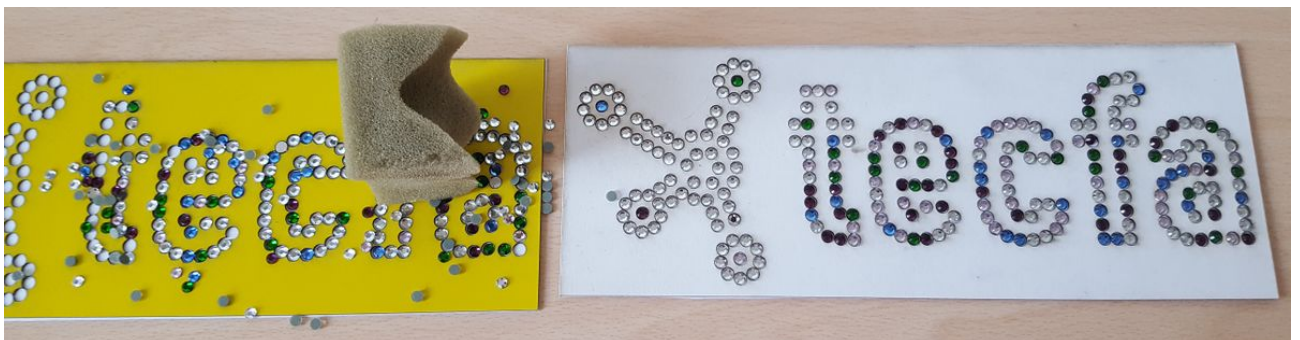
Put the rhinestone into the holes and make sure that all are in position.

To do so, put a **whole big lot** of stones over the stencil and then gently brush forth and back with a foam brush or a piece of flat soft foam that you could retrieve from some packing or your mattress. This technique works because stones sitting on the flat side and in the right trajectory will be pushed into the holes and stick there. Turned stones in the holes on the other hand will be removed. Again, make sure to pour a big pile of stones over the template. Otherwise you will spend much more time brushing.

Make sure that there no extra stones left and that **each** stone is in position



Brush stones into the hole with a foam brush (or piece of soft packing foam)

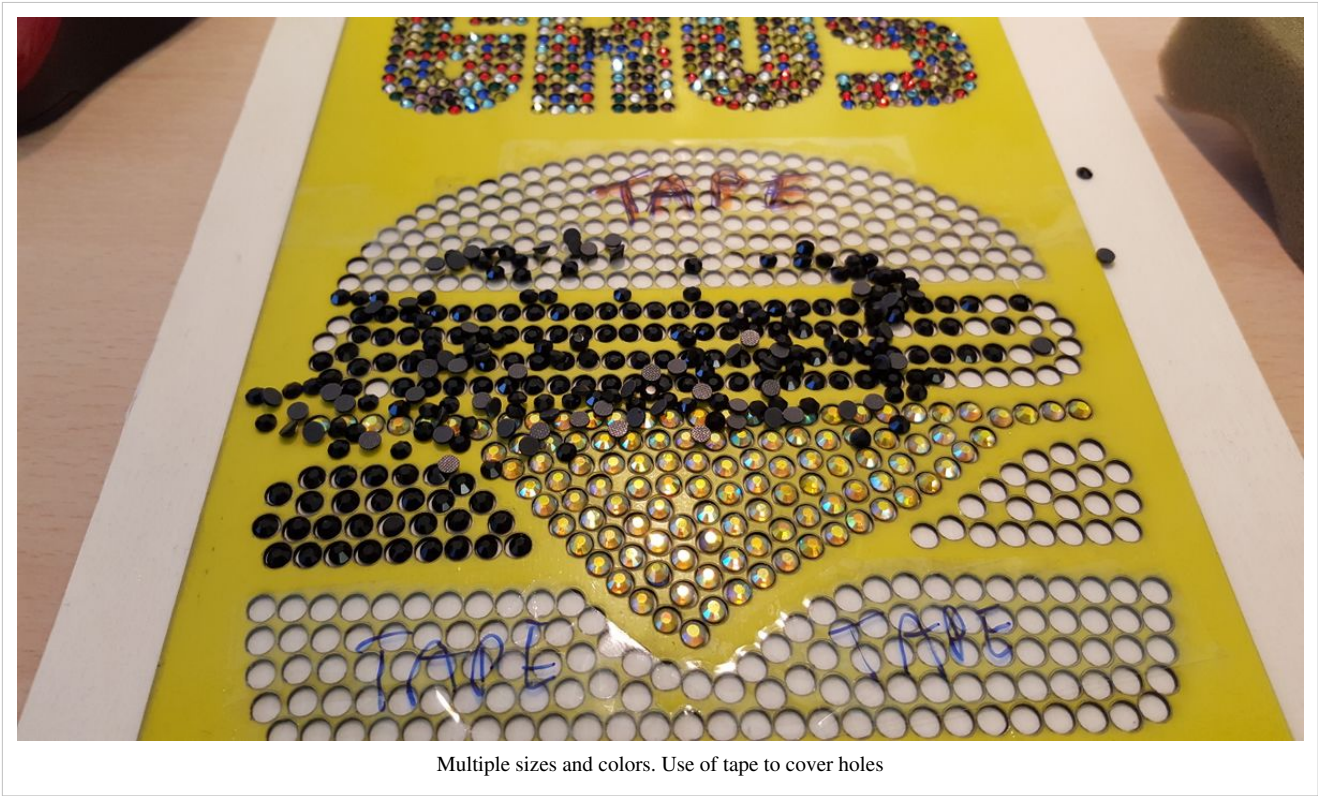


Both cardboard and acrylic work (but do not insert acrylic into a heat press!)

Extra tips for single templates:

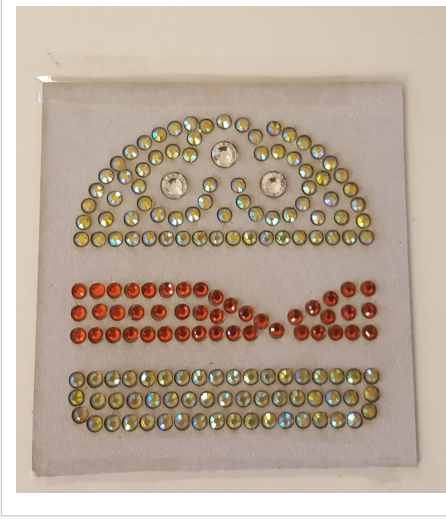
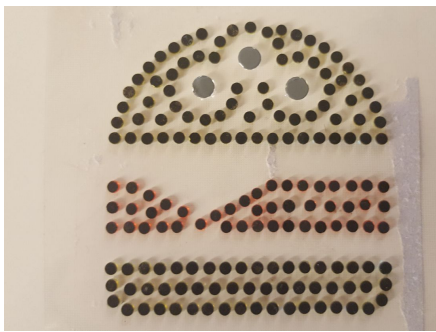

- If you got stones of different sizes (e.g. SS16 and SS10) in your template, then brush in the big ones first. Otherwise the small ones will go into the hole of the big ones and you will have to retrieve these, e.g. with a piece of adhesive gum.

- If you got different colors of the same size, close the holes for the other colors with some tape and then remove them gradually. Alternatively, create different templates, one for each color/size combination.
- Make sure that the surface of the template is flat, in particular, holes should not have little walls sticking up.



Step 4

Once the stones are in place, put a heat resistant **rhinestone transfer paper** on top and press it down. Some transfer paper, e.g. the one that would use for textiles may not have enough glue and the stones will not stick. Buy something that is better or you will loose some hours to frustration ...

1mm cardboard template	Stones sticking to transfer sheet	Transfer sheet on top of cloth
		
Template is taped to table	Turning the sheet allows checking positions	Ready to press

Design, procedure and result of this hamburger "test" is discussed in more detail in Stitch Era - creating embroidery with hot fix stones.

Step 5 - (Optional) check the pressure of the press

Make sure that the pressure is right with respect to the thickness of the material. According to Peggy Elliot's Heat Press Application Tips: The Right Pressure ^[9] "Too much pressure can cause over-application sometimes driving adhesive out from the heat transfer vinyl so your final design is not properly adhered to the item you've decorated and may fall off. Not enough pressure can cause under-application, designs may not be fully adhered to the fibers of the garment and fall off."

As far as we can, the press must close very firmly without having to force down. E.g. If you cannot remove a sheet of paper from an easily closed heat press, it is OK for pressing stones onto a T-shirt.

Step 6 - Insert cloth in press and flatten

Put the cloth in the press and (optionally) preheat for 5 seconds to get moisture out and to flatten the cloth

Now, if you have two layers of cloth (e.g. a T-shirt), put some baking paper, teflon sheet or similar between the layers. Else, glue will not just glue the stones but also the textiles together. In any case we strongly suggest using baking paper underneath the surface to be pressed since it also will protect the map from soaking glue.

Apply the transfer sheet with the attached stones on top of the cloth. Make sure to aim for the right place and directions. To help with that you could marke the upper line with removable tape. Stretch out the transfer sheet, then press it down from the top. Ask a second person for help if needed.

Step 7 - Press

Put baking paper on top to protect the teflon coating of the press.

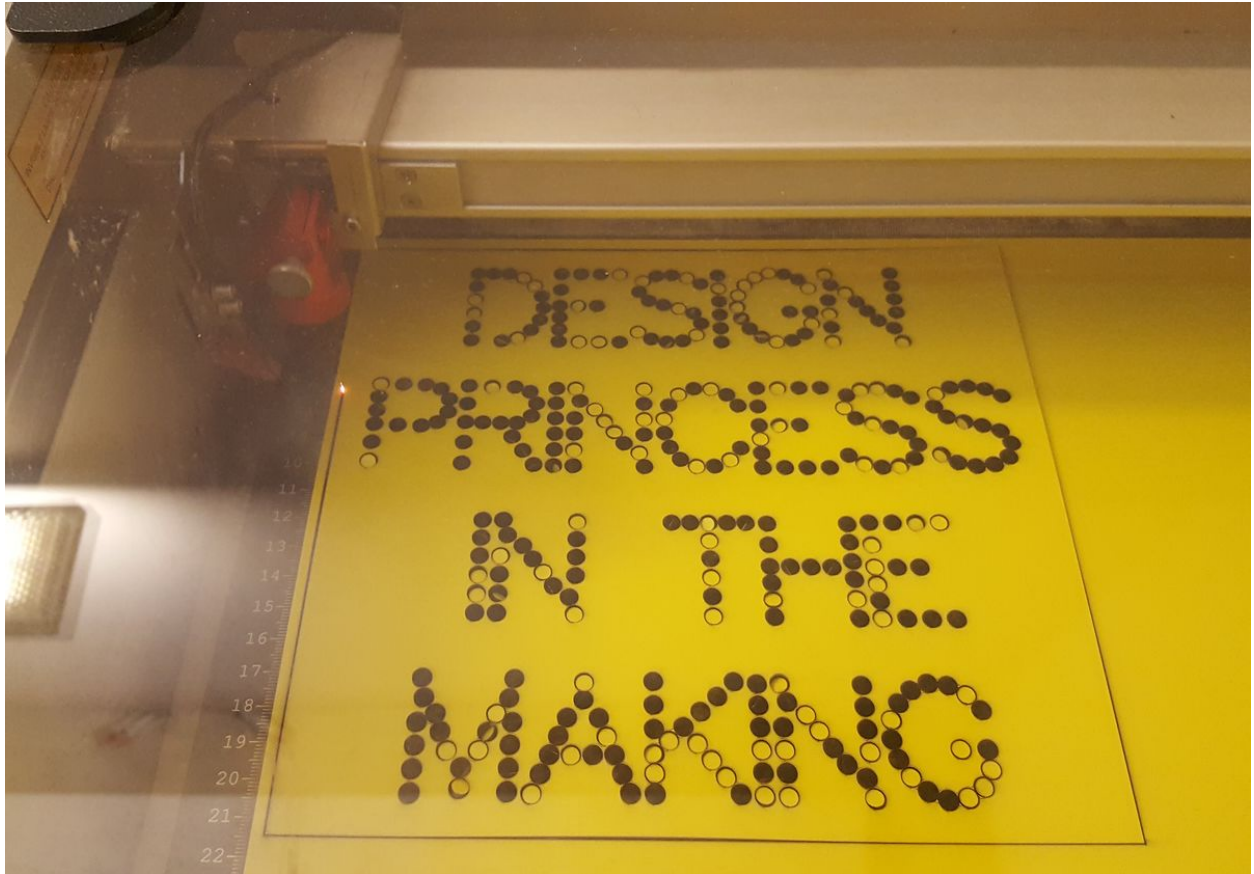
Heat for about 20 seconds for SS16 stones at 200C. Larger stones may need more

- Let it cool down entirely, then peel away the transfer sheet.
- Make repairs with a stone applicator if needed or press the design again. However, second and third pressing may dilute the glue a bit too much.

Using a template and a heat press the simple way

Since I was frustrated by some transfer paper onto which the stones would not stick, I came up with a more simple solution on day one (i.e. my first design testing the newly arrived heat press)

I first created two designs using some nice acrylic plastic (because I didn't have any free cardboard at hand). Since the transfer paper method did not work I found some cardboard raiding the cupboards and did it again



Laser cutting 0.8mm Trolase acrylic sheets

Create a cardboard template

- Create a template from thin cardboard.
- Thickness does not matter much if the stones stick out well and if it is thick enough for the "brushing method).

I measured the height of the rhinestones I got (don't know what brand they are):

- SS16 - 1.5mm height
- SS20 - 2mm height
- SS34 - 3mm height

For example, as shown in the tests below, 1mm of cardboard for SS20 stones was OK, and 0.7mm cardboard was OK for SS16. I don't know if 1mm would be OK for SS16.

The template should be flat, otherwise the stones will move out of position (underneath the cardboard). Tape it down if it bends a little.

Use the template in the heat press

Below are the steps. Follow all of them and think ! Since this procedure is not document in other places as far as I can tell you may experiment a bit.

1. Put the cloth on the heat press (just one layer, else insert baking paper between the layers)
2. If the cloth is wrinkled, heat the press and press for 4 seconds.
3. Put the template on top of the smooth cloth and tape it down on the edges.
4. Insert the rhinestones as above (e.g. pour a big pile of stones on top and then use some piece of soft foam to insert them into the holes)
5. Make sure that every stone is flat and that there are not stones left
6. Heat for 20 seconds at 200C
7. Wait to let it cool down ! Do not remove the cardboard before the stones are cold again

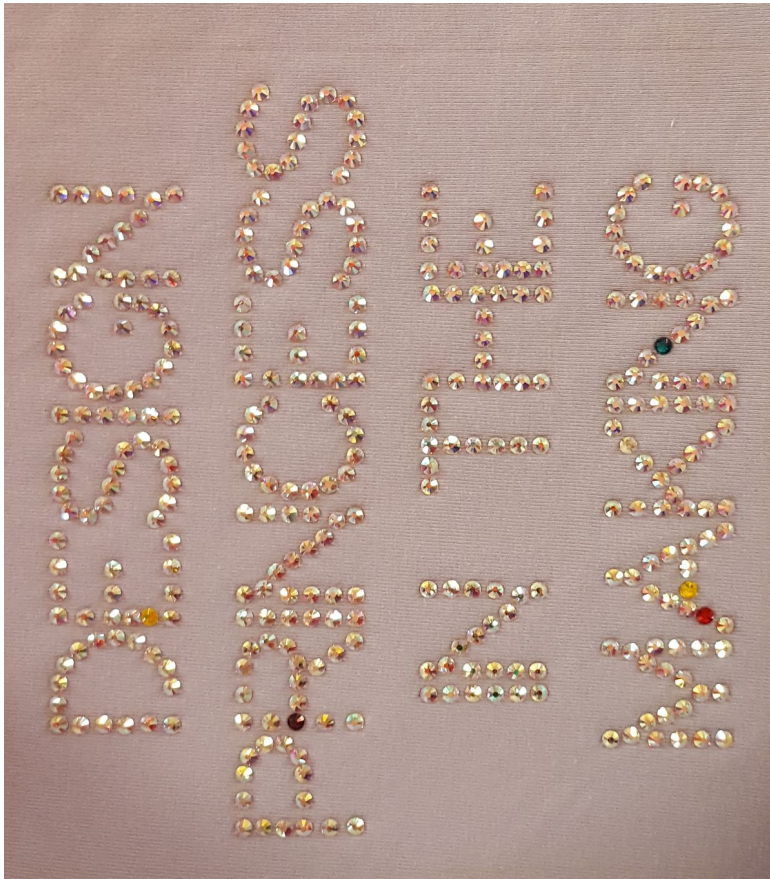


Before heating. Template will remain in the heat press



Before heating. Position of stones looks OK

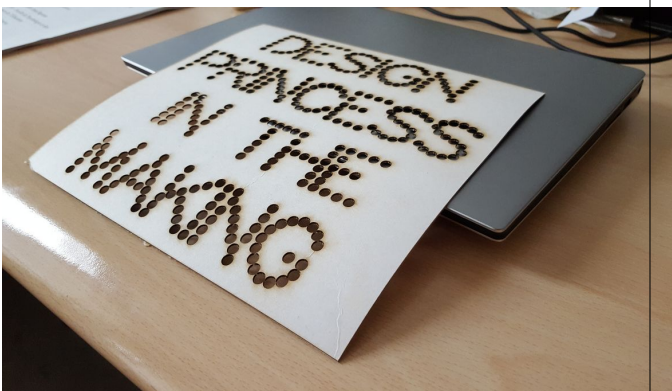
The next pictures shows the result. The colored stones were in the same "crystal" pack as a surprise. Unfortunately they did not have glue at bottom. I only figured that after the second attempt to press them down. In other words, the same design had been pressed three times with no apparent damage. The last version only includes the clear stones and do have glue.



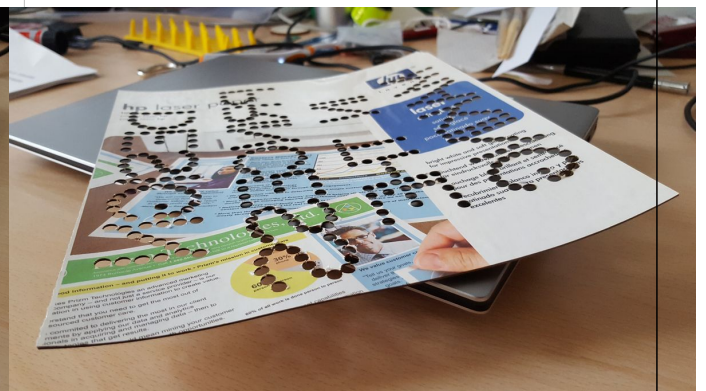
After cooling down and removing the cardboard.

Tips

Disadvantage of this method may be that the cardboard can change its form after heating. Avoid cardboard with paint. On the positive side, it seems that paint found on a typical cardboard box for office supplies does not melt. See the two pictures below. Also the wrapping is probably due to the fact that one side had paint and the other did not.



Warped cardboard after use



Warped cardboard back

You should tape down the cardboard **before setting the stones**. Use short length of tape and make "handles" so that you can pull the tape away again before printing. Alternatively, use heat resistant tape such as Kapton. Ask a 3D-printing friend for some or order it from an online outlet. A friend also suggested trying out some special type of glue on the backside of the template, i.e. 3M™ Repositionable 75 Spray Adhesive ^[10] (I did not try yet).



Taped template for SS16 stones, 4-5 empty holes remain

The picture below shows the result. It's not an artistic master piece. Choice of colors is bad, design could be improved. But at this stage (our second hotfix) we were just testing the transfer method and therefore we are happy with the result. The little oval design on top was made by hand for testing the use of the newly arrived heat press. Two weeks before, we didn't even know that such things existed ...



SS16 stone design (our second hotfix design and print)

Ordinary grey cardboard does not seem to warp, neither in the laser cutter nor under the heat press. Below is rather large example that taught me the limit of this method. This method only works if the fabric is totally flat (otherwise stones will glide underneath the cardboard). Also, it is much more suitable for stones that are larger than SS16 and it is not suitable for SS10 and smaller since these stones will not "sit" in position.

The following design was larger than the heat transfer press, i.e. about 55cm width. I just cut the template in two halves and did the left one first.



Larger than the heat press design, "direct method"



Professor Strass

Links

Various

- Rhinestone ^[3] (Wikipedia)
- Understanding Hot Fix ^[7] (Harman), retrieved oct 2017

Transfer techniques

- How to Apply Hotfix Crystals ^[11], by: Khaled January 22, 2012, retrieved oct 2017
- How to apply hotfix crystals with an Applicator ^[12], Zyneri blogs, retr. oct 2017.
- How to Heat Press Rhinestone Transfers... the right way ^[13], Colman, retr. oct 2017.
- Help & Video Education ^[14] at Stahls.com ^[15], e.g.
 - Guide: 7 Popular Heat Transfer Styles ^[16], Stahls.com (retrieved oct. 2017)
 - The Ultimate Guide To Design Size & Placement ^[17] Stahls.com (retrieved oct. 2017)

Using a heat presses

- See heat press

References

- [1] <http://www.publicdomainpictures.net/view-image.php?image=19771&picture=sequin-pattern-2>
- [2] <http://www.crystalandglassbeads.com/blog/2014/flatback-crystals-guide.html>
- [3] <https://en.wikipedia.org/wiki/Rhinestone>
- [4] <https://www.creativecrystal.com/pages/hot-fix-crystal-sizes-made-simple>
- [5] <https://www.swarovski-professional.com/>
- [6] <http://preciosacomponents.com/en/>
- [7] <http://www.harmanbeads.com/understanding-swarovski-hot-fix-rhinestones>
- [8] https://en.wikipedia.org/wiki/Parchment_paper
- [9] <http://blog.stahls.com/heat-press-application-tips-heat-press-pressure/>
- [10] https://www.3m.com/3M/en_US/company-us/all-3m-products/~3M-Repositionable-75-Spray-Adhesive?N=5002385+3293194087&rt=rud
- [11] <http://www.crystalandglassbeads.com/blog/2012/how-to-apply-hotfix-crystals.html>
- [12] <http://zyneri.com/how-to-apply-hotfix-crystals-with-an-applicator/>
- [13] <https://colmanandcompany.com/blog/2014/06/press-rhinestone-transfer-right-way/>
- [14] <https://www.stahls.com/help-education?icn=topnavhvt&ici=education>
- [15] <http://Stahls.com>
- [16] <https://www.stahls.com/guide-popular-heat-transfer-styles>
- [17] <https://www.teesandprints.com/wp-content/uploads/2017/01/Design-Placement-Guide-Links-20160929.pdf>

Heat press

Draft

Introduction

According to Wikipedia ^[1], "A heat press is a machine engineered to imprint a design or graphic on a substrate, such as a t-shirt, with the application of heat and pressure for a preset period of time. While heat presses are often used to apply designs to fabrics, specially designed presses can also be used to imprint designs on mugs, plates, jigsaw puzzles, caps, and other products."

In french: "presse de transfert", "presse thermique", "presse à chaud". In german: transferpresse, hitze presse, textilpresse

Selecting and buying a heat press

Serious hobby machines come in three formats: either as clam-shell type or with a swivel swing arm or with drawer style lower plateau. As explained in the Hotfix stone article, we prefer the swivel model, since it allows working with the inserted textile without being exposed to the heated top.

We own a Ricoo T538B heat press.

If you live in Europe, buying in Germany is probably cheaper. E.g. a same model was 300 Euros on the german and 500 on the french Amazon site. Most cheaper models seem to have small problems identified in various online reviews. A good German make cannot be found under 600 Euros. However, we are a happy with "serious entry level" one we bought.

Other models I had a look at: **Low end** (with hopefully acceptable quality)

- Craftpress \$295.00
 - Fenta Pink Hobbypress 270 CHF (30 x 23cm swivel model)
-

- Fenta Pink-Press, 360 CHF
- Krativegewerbe.dh - 38 x 38 cm Swivelling transfer press, 360 Euros (looks like the Ricoo T438)
- Hobbysqueezy, 250 Euros to 400 CHF (30 x 22cm), full opening, but no timer.
- Profisquezy, 38 x 38cm, 400 Euros
- Ridgeyard 166 Euros (Amazon.fr)
- HobbyCut AA1-S (230 - 280 €), e.g. from airbrush ^[2]
- Hyppypress
- HappyPress 3. 30 x 21cm, (340 Euros)
- Ricoo Powerdwarf, 300x23 cm, Swivel, 260 Euros
- Ricoo T538-TB (340 €)
- Ricoo T438M (300 to 500 Euros !)

Mid end

- Secabo TC2 (23 x 33cm), 435 Euros
- Secabo C2 (38 x 38 cm), 350 Euros
- Secabo TC5 (38 x 38), 610 Euros.
- Hotronix Digital Clam, \$950\$

Links

- Heat Press ^[1] (Wikipedia)
- Heat transfer vinyl ^[3] (Wikipedia)
- Dye-sublimation printer ^[4] (Wikipedia)
- Transfer paper ^[5]
- Help & Video Education ^[14] at Stahls.com ^[15], e.g.
 - Heat Press Buying Guide ^[6] by Josh Ellsworth, stahls.com. (retrieved oct. 2017)
 - Guide: 7 Popular Heat Transfer Styles ^[16], Stahls.com (retrieved oct. 2017)
 - The Ultimate Guide To Design Size & Placement ^[17] Stahls.com (retrieved oct. 2017)

References

[1] https://en.wikipedia.org/wiki/Heat_press

[2] <https://www.airbrush-city.de/hobbycut-aa1-s-transferpresse-38cm-x-38cm-textilpresse-2000-watt/a-190494/>

[3] https://en.wikipedia.org/wiki/Heat_transfer_vinyl

[4] https://en.wikipedia.org/wiki/Dye-sublimation_printer

[5] https://en.wikipedia.org/wiki/Transfer_paper

[6] <https://www.stahls.com/stahls/content/images/landing-pages/heat-press-buying-guide/HeatPress-BuyingGuide-EBook.pdf>

Ricoo T538B heat press

Introduction

The Ricoo T538B heat press is a heat press suitable for various transfer prints, e.g. hotfix stones, sublimation print, or various "iron on" plastics. TECFA received this model on October 18, 2017. Below, a picture of the first interesting "print" in progress and you can see more pictures in the hotfix stone article.



Ready to go !

See also:

- [Stitch Era - creating hot fix designs](#)
- [Hotfix stone](#)

Model price and specifications

- Model: Schwenk Transfer Presse T Shirt Druck selber machen T538 ^[1]
- We bought it for 340€ + 21€ Shipping on Amazon.de ^[2] and the list price is higher.

Specifications and parts

- It has a swivel swing arm which seems to be safer to use and more practical for this type of work.
- 38 x 38 cm (15) *print area*
- It has springs (probably better for the distribution of pressure) and a Sviel system (easier positioning of the cloth plus materials and probably better protection against burns).
- A fat black mat
- Digital temperature (0-399 C) and timer setting (0-999 seconds)
- Heat plate can be moved up or down (5cm distance max.)
- 26 kg



Ricoo T538B heat press

There are **three** different control interface variants according to the manual. We got version II (picture shown below).

First impressions

This models fits the requirements we outlined in the Hotfix stone article.

At the time of writing we did three hotfix stone (strass) prints. All went well and the interface is easy to understand. By default, the temperature is already set to 200C and the timer to 10 seconds (that we changed to 20 seconds). I have no idea if this machine is of professional quality, but it certainly beats applying stuff with an iron and I am happy with the results so far. I do appreciate that pressure (i.e. distance) can be very easily changed and that there are springs and a fat big mat that should distribute it evenly.

Although the machine takes up a lot of space I recommend that type of model for working with hotfix stones. I did manage to print designs with SS20 and SS16 stones that I directly put on the t-shirt using a laser cut cardboard template. No transfer sheet, just some baking paper on top :)

I have seen large price differences for this machine. Ordering from Germany to France for use in Switzerland went fast and smoothly. It was packed in a big cardboard box and stabilized by two solid packing foam elements.

Instructions

This applies to variant II

Ajust feet

- The machine should stand very stable on its four feet
- Adjust the knobs below and make sure that it does not wobble

Temperature setting

- By default, after unpacking the temperature was to 200C which is just fine
- Press **OK** once - you should see **P1-1** on the screen
- Use the up/down buttons to change
- Press **OK** once if you want to change the timer or twice to exit

Change Temperature display from C to F (or the other way round):

- Press **OK** for 5 seconds - You should see **P-3** on the screen
- Press up or down arrow and confirm with **OK** for 5 seconds

Timer

- Press **OK** twice - you should see **P-2**
- Adjust with up/down buttons. We set our default to 20 seconds.
- Press **OK** to confirm
- You can test the duration by pressing **Enter**

Pressure adjustment

- Is purely mechanical, i.e. electronics will not tell anything.
- Before heating, test if the lever can be pulled down and at the same time offers some resistance (i.e. really applies some pressure but not too much). Test with objects in place, e.g. textile, cooking paper, some rhinestones.
- Adjust with the big knob on top of the vertical arm.

Warning

- Do no heat over 220C
- Tell people around you to be careful
- To not open the svivel arm 180 degrees (it becomes a bit unstable)

Daily operations

Move the heating platform out of the way, then add some baking paper, put the cloth and stones on top.

If you are ready add some baking paper again and switch the machine on. Wait until you hear the alarm for reaching the full temperature (it is also on display), Then svivel the plate in place and press down. The timer will automatically start after the lever is pressed down. Wait for the alarm to open (e.g. after 10 to 20 seconds according to your settings).

In other words, you won't have to do much if you are happy with your settings.

Tips

- When you press down, do not move laterally. Down means vertically down.
- Let the stones cool down after opening. Do not try to pull anything away. The glue will still be wet !



Ricoo Variant 2 control interface

- Put the machine near a corner of a table. That way heat will not reflect on the table in open position. See the picture below.
- Do not burn the electric cable. Make that it goes down straight.



Ready to go !

Maintenance

Remove the the electric cable before any maintenance work !

The heating plate on top is teflon coated and should neither scratched with powder, brushes, etc. nor alcohol, benzine and other solvants. Use a mild detergent and a soft cloth.

The bottom silicone mat can be pulled off and the sticky rests can be scratched away. The new one should be glued with heat resistant glue, pressed down gently and left alone for 24h.

Links

Documentation

Official

- Schwenk Transfer Presse T Shirt Druck selber machen T538 ^[1] (Product Page)
- Manual ^[3] Operations manual in German)

General

- Heat press (Wikipedia) ^[1]

References

- [1] <https://www.ricoo.eu/schwenk-transfer-presse-t-shirt-druck-selber-machen-t538b/a-10433/>
- [2] https://www.amazon.de/gp/product/B01E45NMG0/ref=ask_ql_qh_dp_hza?th=1
- [3] https://www.ricoo.eu/layout/bedienungsanleitung/gewerbe-industrie/transferpresse/Transferpresse_T538_B.pdf

Hot fix

Stitch Era - creating hot fix designs

Introduction

This beginner's tutorial for the Stitch Era embroidery software explains how to create designs for hotfix stones.

Tutorial home page

Stitch Era embroidery software

Learning goals

Digitize a vector graphic into a hotfix stone (rhinestone, strass) design

Use various lettering methods

Manipulate hotfix area parameters

Edit individual hotfix

Prerequisites

Stitch Era embroidery software and Stitch Era - creating embroidery from vector images (in particular, be able to create a design defined by vector graphics).

Next steps

Stitch Era - creating embroidery with hot fix stones

Related pages

Hotfix stone

Materials

You can reuse the pictures. In the wiki, click on picture to make it larger, then click again and save it.

Quality and level

This text should technical people get going with Stitch Era. I use it for an optional master degree course in educational technology.

Last major update

October 2017.

Stitch Era includes an extension module that allows creating hotfix design templates (also called rhinestones or strass). The module is also available as stand alone program under the name of "Hotfix Era". This software allows filling "areas" with "holes" for hotfix stones according to various parameters. The design then can be sent to a vinyl cutter or a laser cutter in order to create a template.

The principle for creating a hotfix design is the same as creating embroidery areas. Instead of filling with a stitch patterns, areas will be filled with "beads", i.e. circles that position each bead. As explained in the hotfix stone article, there are different methods to place the beads. Without much technology, one can:

- manually set the stones with an applicator (a kind of soldering iron with a special tip);
- or print the design on paper, put the stones in place on the paper (flat side down), apply a transfer sheet and then move the attached stones onto the fabric.

Larger designs do need some technology. There are two options:

- Create a template, e.g., a 0.5mm thick cardboard, insert the stones, then as above, use a transfer sheet. It will allow handling designs with hundreds of stones fairly easily.
- Use a stone setting machine (various types exist, not discussed here)

The template method

We will use the template method. With the Stitch Era hotfix module, one can create a design template, export to a vector format (e.g. SVG or DXF) and then cut out the holes with a laser cutter or a cutting plotter. Typically you would use 0.5mm cardboard or some strong textile. Below, we quote the procedure from an older version Stitch Era V11 manual ^[1] (retrieved oct. 2017), with slight modifications.

The key of this method is to create templates or stencils. Since you cannot easily sort out different sizes and colors beads, you need one template for each different piece (different size, shape and color) your design uses. A template is a rigid plate with a set of small deep (0.5 mm) depressions or marks, arranged according the design, in the places where the hotfix pieces should be set. Marks have to be of the same shape of the piece they are intended for, but a bit larger.

The idea is to spread a handful of hotfix pieces over the template and to let them to become trapped in the marks. This happens because hotfix pieces have a flat side (the back) and a round side (the front). So, they become trapped with the shining side up. Usually, a soft brush (e.g. foam) is used to drag the beads over the template until all marks are occupied. Then, a sheet of transfer material (with the adhesive toward the pieces) is pressed by hand against the template. When the transfer sheet is removed from the template, all beads are attached to it. The transfer sheet is then placed on the garment placed in a heat press with the adhesive toward the garment. One also could use an iron, however the result may not be as good since it is difficult to apply it evenly with the right temperature and pressure.

Hotfix can send files directly to some plotters and laser cutter brands. Instead we export to SVG format that we will modify a bit before sending it to the laser cutter, i.e. in our setting the cutting lines must be red (RGB 255,0,0) and have 0.01mm width. If not done in Stitch Era, we also will have to add a cutting rectangle around the design with some margin and adjust the size of the whole print.

Stitch Era will automatically make the holes a bit bigger. E.g. an SS16 (3.8 to 4mm) stone will be represented with a 4.5mm circle, i.e. it will add 0.3mm (dec mm) to the 1.95mm typical radius of an SS16. This setting can be changed in `File` tab, Preferences setup -> *Application* -> *Project* -> *Hotfix* -> *Hotfix cutting margin*. It probably should be reduced if you have a laser cutter (see the test below). E.g. 0.2mm should be enough.

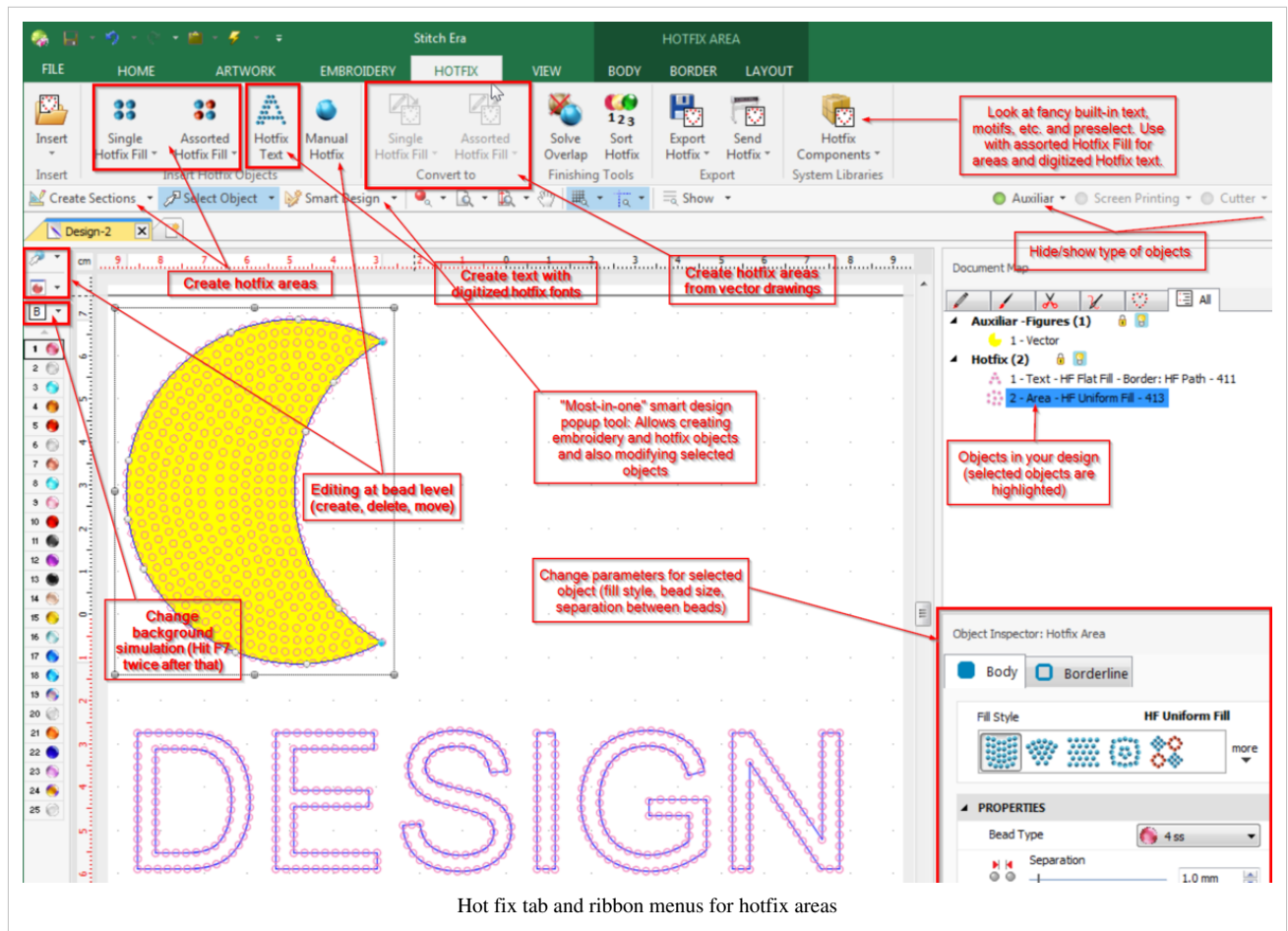
If you don't own a cutting plotter or laser cutter, you may use a cardboard around 0.5 mm thick and drill on it holes a little larger than the beads, e.g. for an SS16 (4mm) use 4.5mm. You may use a Hotfix Era printout of the design 1:1 scale as a reference. Print on cardboard or glue the paper on top.

The drilled template can be glued on top of another board piece of the same size. The template will be ready to use. If you do not glue something to the bottom, make sure to use a very flat surface and do not to move the template while you fill it with stones. Otherwise you may have to restart since it may slip over the stones that are already in place.

Different design methods

As for embroidery, Stitch Era with the hotfix module (or Hotfix Era) offers a whole range of design path for hotfixing. Functionality can be different according to software level. Here we will discuss a version we obtained for our students and that is integrated within Stitch Era.

As for embroidery, you could start designing from a raster image or from vector drawings and then digitize to hotfix areas. On the hotfix side, you can draw high-level objects and fill them according to various parameters, you can use a lettering module or you can work at the individual bead level. The moon below was created as vector graphics and then filled with hotfix stones, using the "Single Hotfix Fill" pull-down menu in the middle (see below)



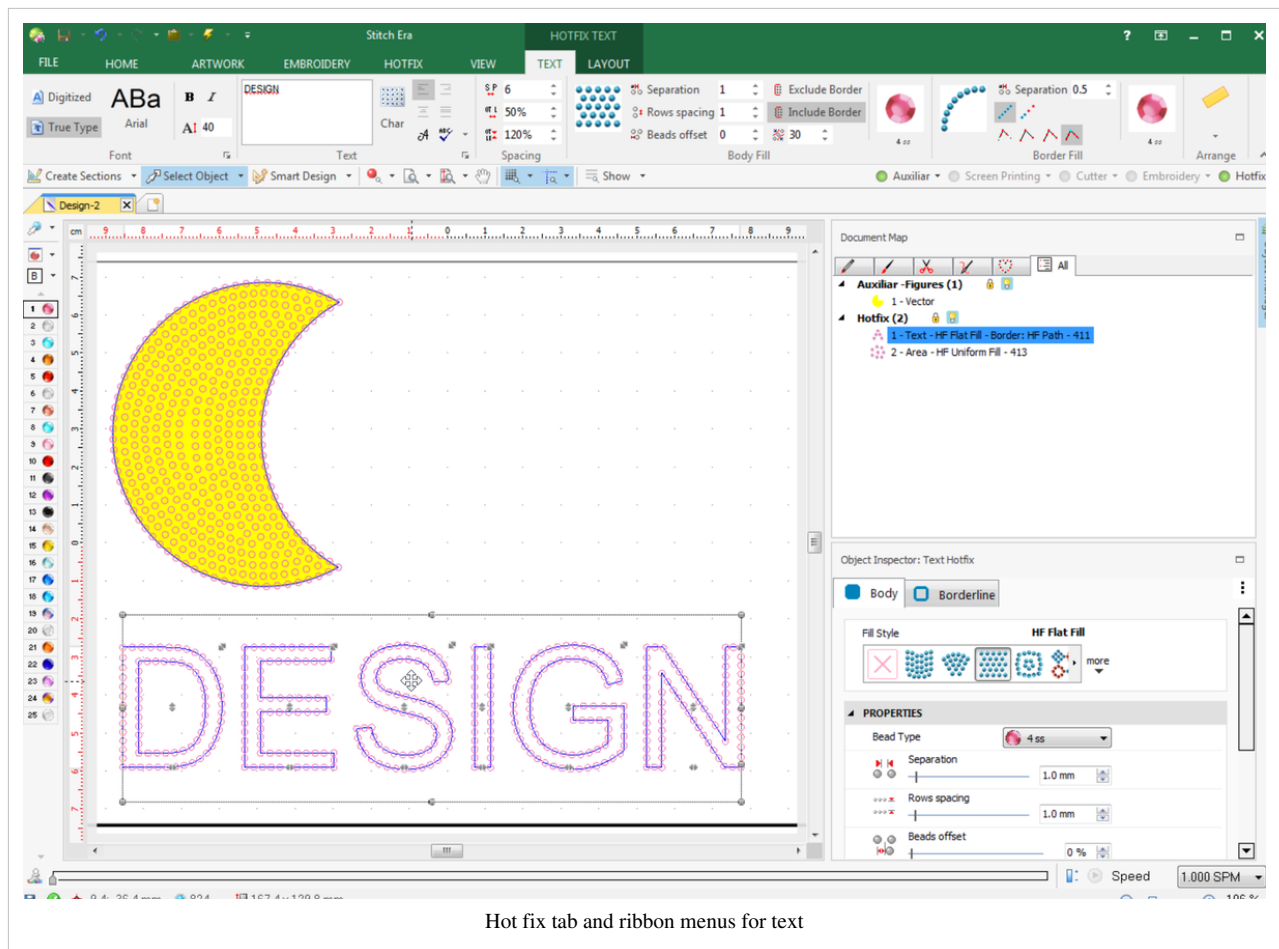
In the ribbon menu, there are about four hotfix creation tools. From left to right:

- Two tools for creating hotfix areas by clicking and/or dragging the mouse in the workspace. Use the context menu (right click) to close a drawing and again to create it. Read the section of working with Bezier curves in Stitch Era - vector graphics.
- A button to create individual beads (Manual hotfix)
- The text creation tool (will change the menu layout)
- The conversion tool from vector objects to hotfix areas

In addition in the main menu (below the ribbon menu bar), there are tools that allow doing the same, in particular the "Create Sections" and "Smart Design" pull-down menu.

On top of the beads palette you find three little pull down menus: The first two allow making modifications at the beads level (e.g. Edit beads) and one below allows defining a background picture.

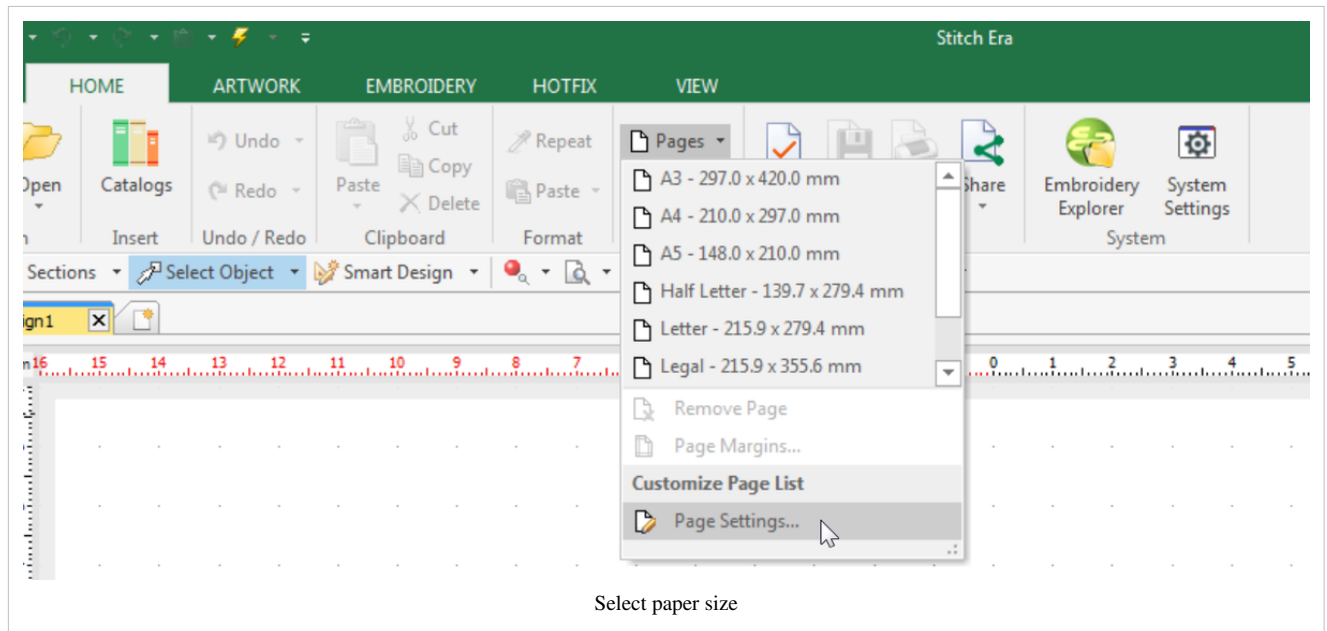
As soon as you click on a hotfixed area in the workspace the interface will adapt its ribbons to it. E.g. clicking on text object will show `hotfix text` with two sub-tabs: `text` and `layout` as shown in the next screen capture.



Size and placement

Before starting to design we suggest defining a "paper size" (or a "hoop size" if you also plan to add embroidery to the design).

- Go to the Home
- Select Pages pull down menu
- Either select an existing page size, or create a new one that you then can select.



According to Danielle Petroskey's Ultimate Guide To Design Size & Placement ^[17] (retrieved oct. 2017), below are the most common hotfix design sizes and placements for T-shirts:

Placement of centred design:

- Adult: 8-9cm (3–3.5)" down from the collar
- Youth: 5-7cm (2–3") down from the collar
- Toddler: 5cm (2") down from the collar

Typical Sizes of a design:

- Adult: 28x28cm (11x11")
- Youth or small adult: 26x26cm (10.5x10.5")
- Youth (small): 21x21cm (8.5x8.5)
- Toddler: 14x14 (5.5x5.5")

You cannot do much wrong if you use a landscape A5 size (21 X 14.8 cm) or a 21x21 square. I.e. you can sketch a design on some ordinary portrait A4 office paper.

A really big size for an adult is about 30 x 35.5cm

Sizes and placements for hoodies are similar. Of course, you can apply hotfix stone designs in other areas, e.g. on the sleeves, down the front, on top of the back (similar as above), down the back, hip area, etc. The largest recommend size by Danielle Petroskey is 30.5x35.5cm (12x14)

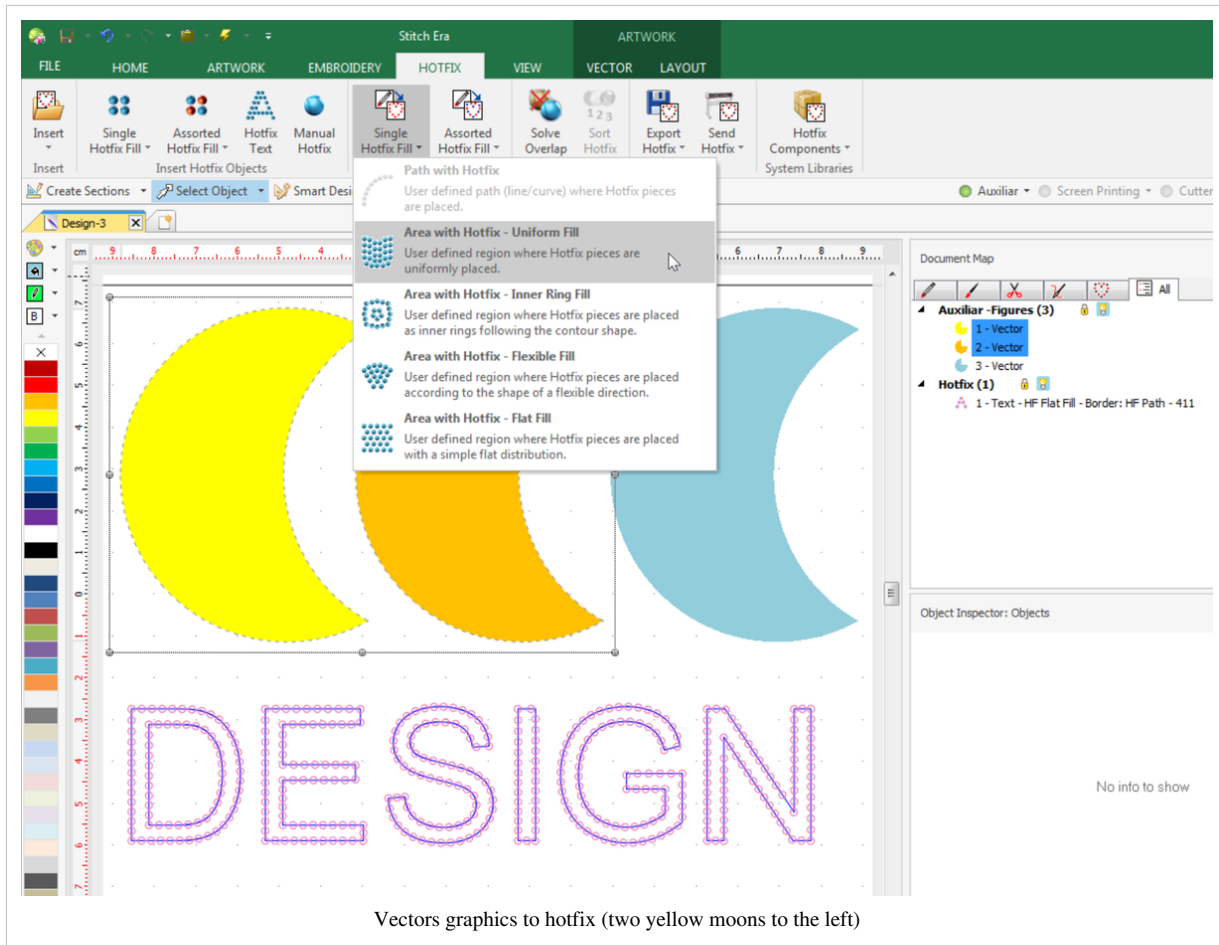
Vector graphics to hotfix

As with embroidery, you can create hotfix designs by drawing or importing vector graphics. In sum, the procedure for translating a series of vector drawing objects to hot stone areas is the following.

Digitizing vector graphics

- Create or import a drawing
- For each object, make sure to define either a fill, a border or both.
- Open the hotfix tab
- Select one or more or all objects and select a fill option in the *single hotfix fill* or *assorted hotfix fill* menu in the middle of the hotfix ribbon menu bar (see screenshot below)

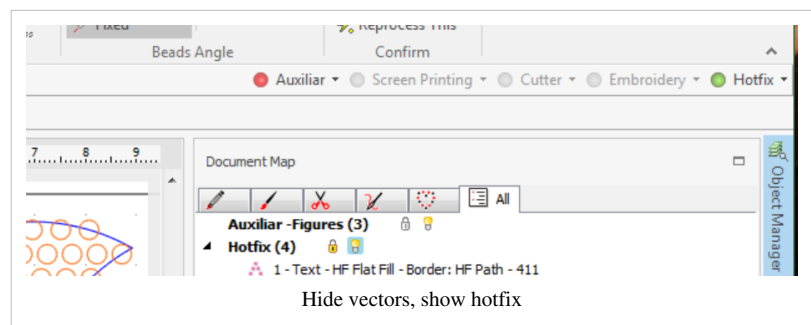
- This will create a hotfix object (path or area) with default values



If you cannot see the result:

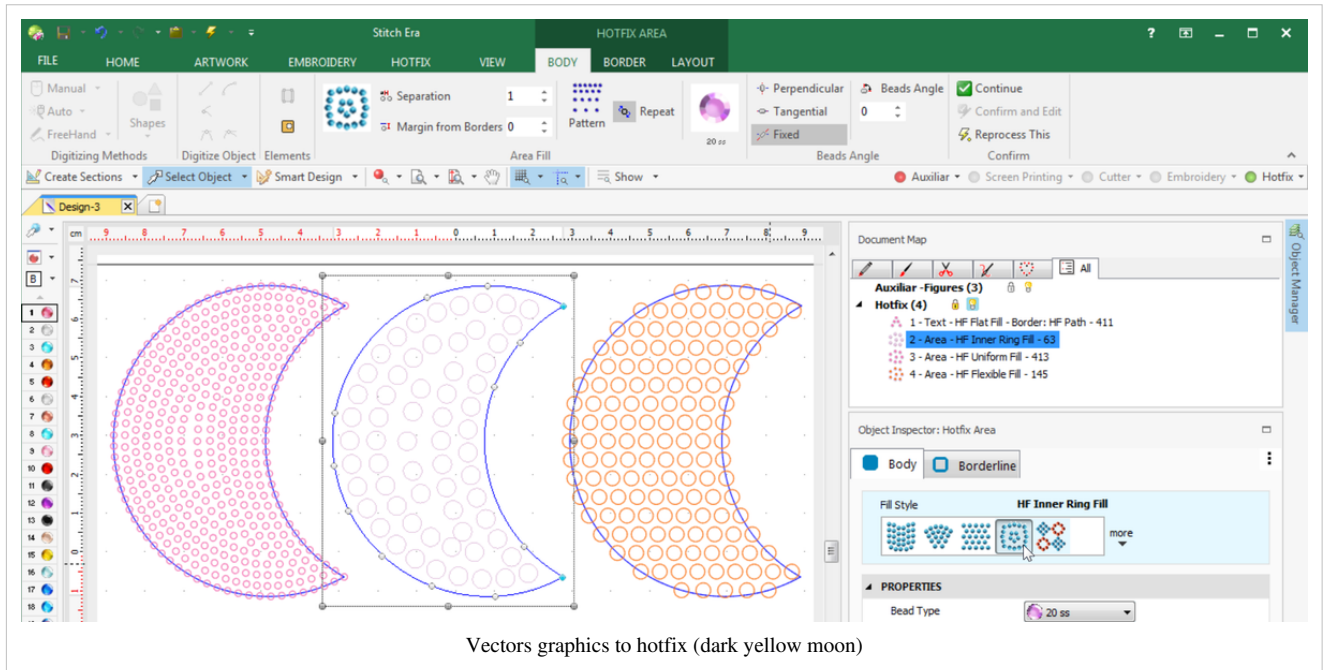
- Make sure to click on hotfix to the right in the menu bar (it must be green). At the same time, you could turn off "auxiliar", i.e. not show the vector drawings.
- Click on the lightning bar on top, i.e. generate the beads if its not done automatically (or hit F9 or FN-F9 on some windows machines)

The moons were created with subtractive geometry as explained in the Stitch Era - vector graphics article.



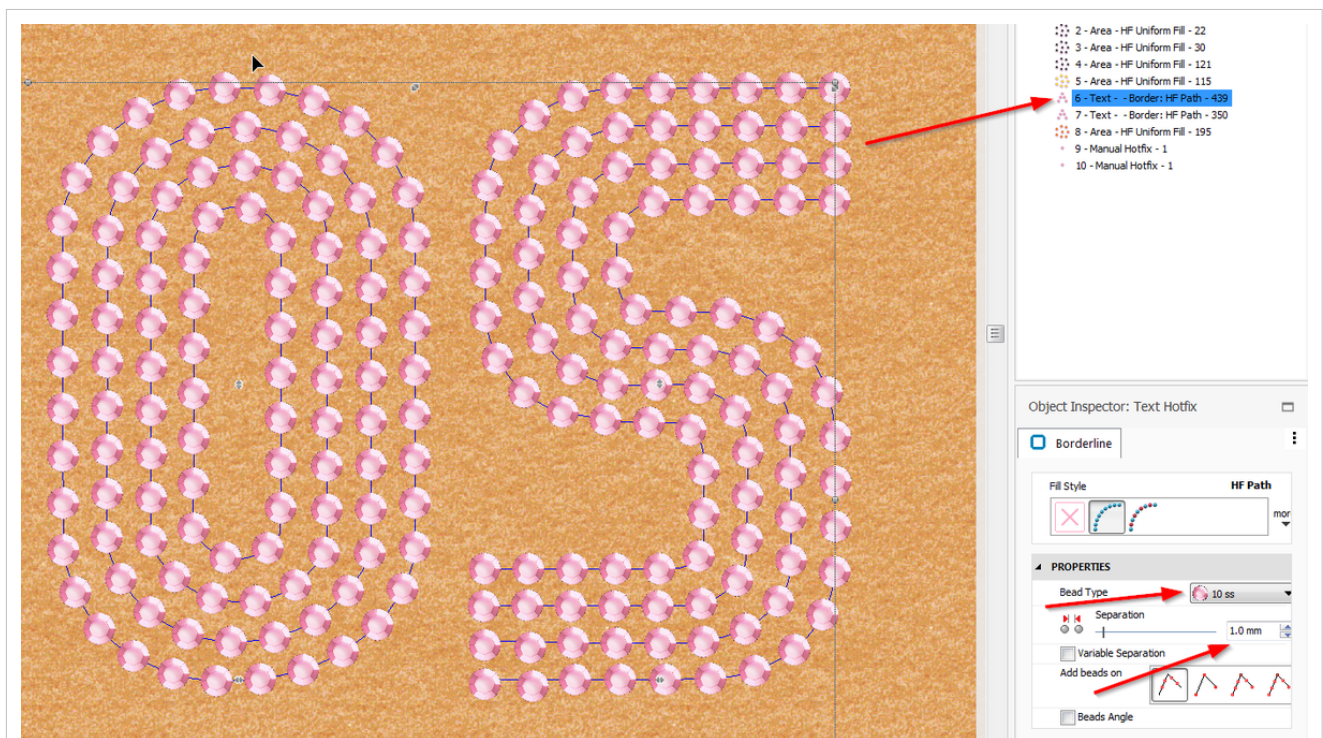
Parametrizing hotfix areas

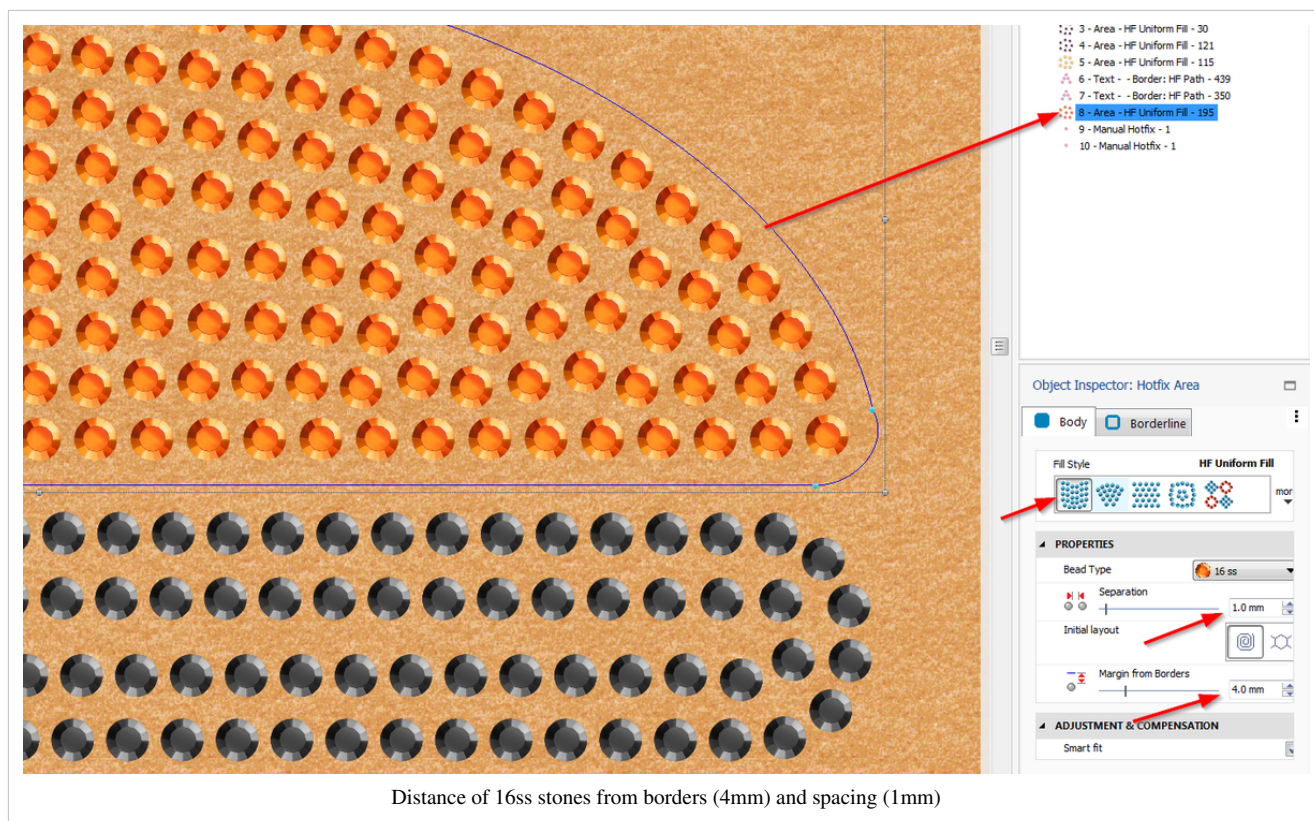
Each hotfix object now can be reparametrized. Below we changed settings for the middle moon. We use SS20 stones and an "HF inner ring fill" as you can see in the screen shot below.



You can specify additional parameters. The most important ones are:

- Distance between stones (we suggest at least 1mm if you plan to work with templates, otherwise cutting the template will not work)
- Distance from borders. By default the stones are place on the borders. In many cases you will want to change this.





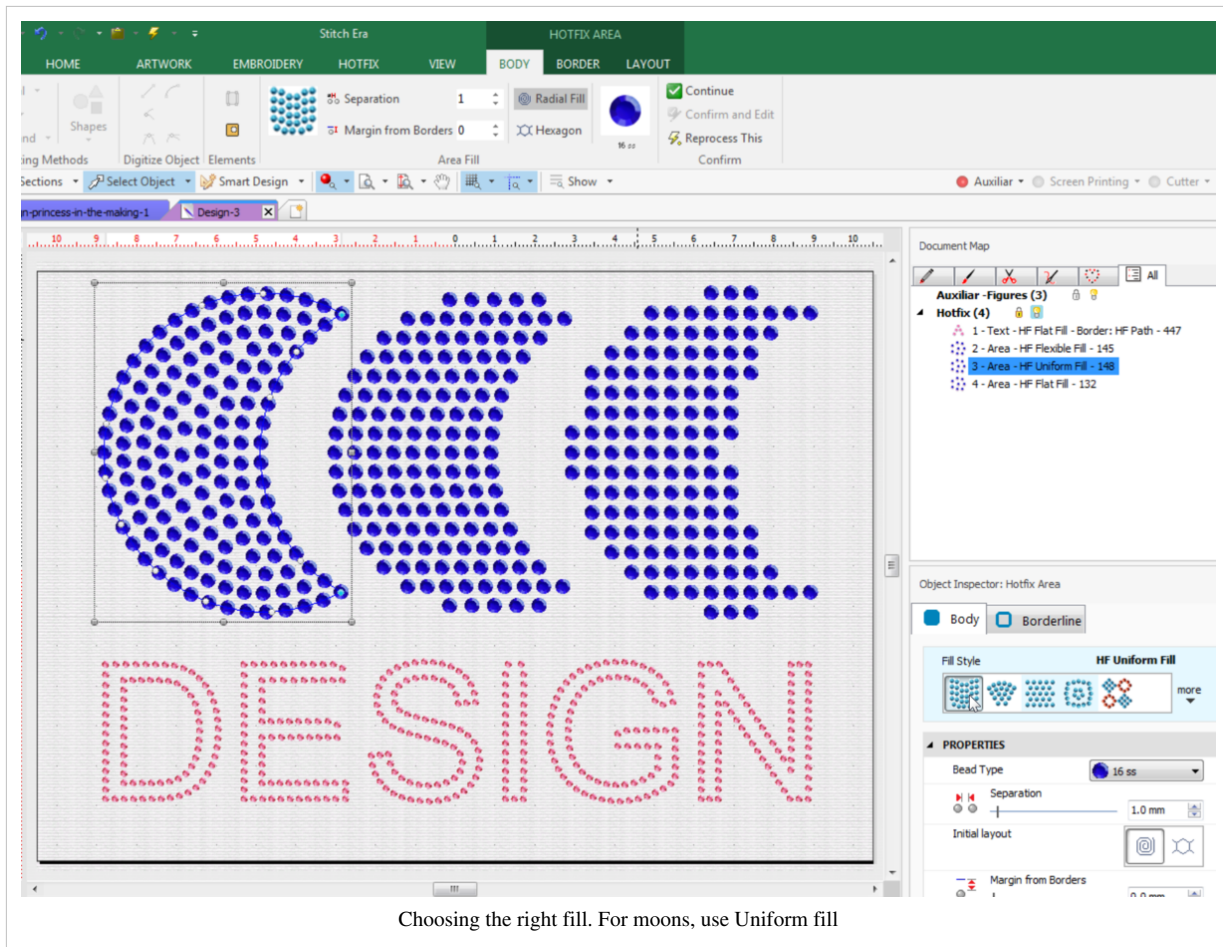
Visualizing the result

In order to see the result in a more telling way, hit F7 (or FN F7 on some machines, or use the little pull down menu with the red ball in the main menu bar)

The following picture shows the three moons with three different fills:

- left moon: HF Uniform fill
- middle moon: HF Flexible fill
- right moon: HF Flat fill

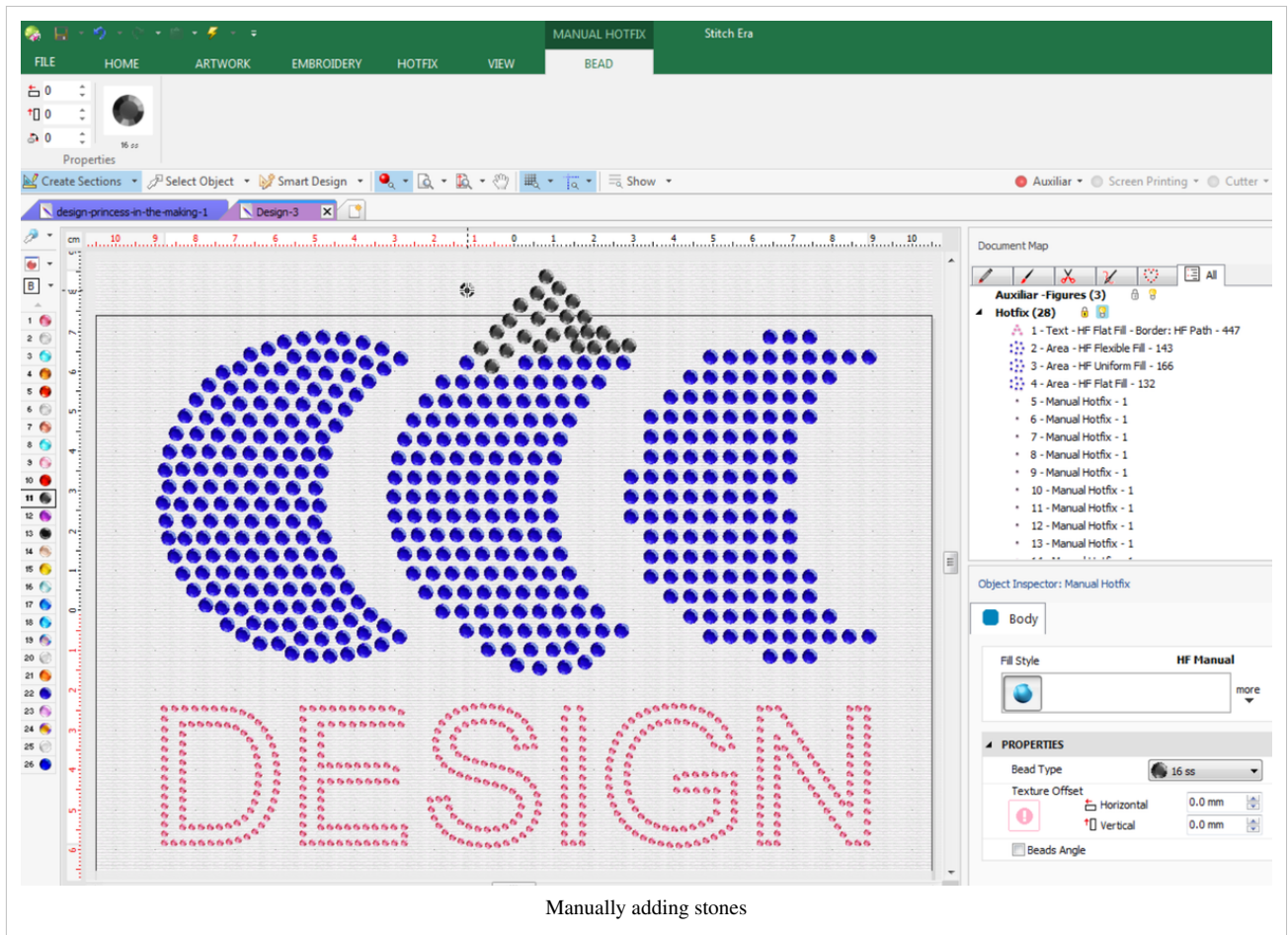
Only the Uniform fill will give good results in this precise case:



If none of the automatic fills looks OK, then play first with additional parameters. E.g. if we wanted a denser fill we could have chosen *Hexagonal* fill (top ribbon menu, or initial layout in the Object manager). In the picture below, we changed the fill of the left moon to Uniform fill / Hexagon variant.

If the result is still unsatisfactory, then choose the best automatic fill and then make manual changes.

- You can **move** and **delete** stones using Edit hotfix mode (pull down menu to the left on top of the palette).
- You can **add** stones using "Manual Hotfix" (select hotfix tab, then select the icon). Before you click, select the right stone in the object manager. In our case (just for the fun of it) we added some grey stones on top of the middle moon and also moved some of the blue ones. To exit from manual editing, click on another tab, then click on "select object" for example.



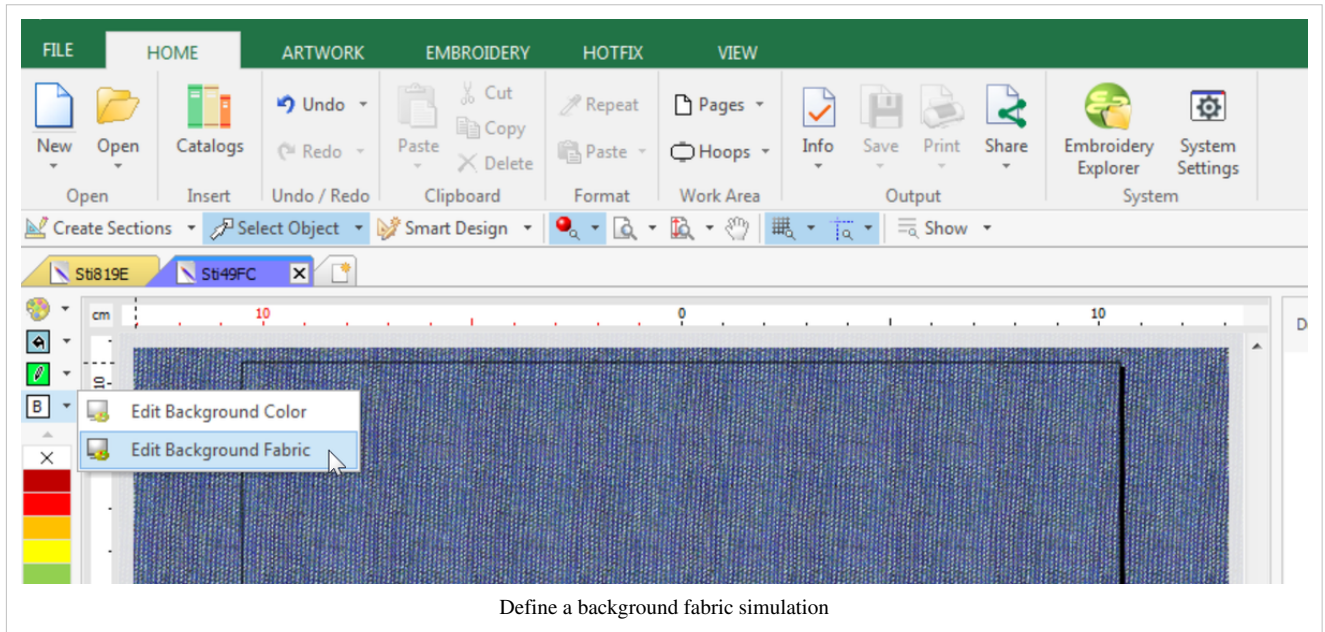
Creating hotfix designs with digitized letters

You can create letters in different ways:

- Use the Hotfix lettering functionality of which exist two variants:
 - Digitized fonts, i.e. fonts that are specially created for hotfix (recommended)
 - True type fonts that you can fill either along the borders, inside the fills, or both
- Draw vectors, then digitize to hotfix (discussed in the next section)

Select size and background

Before creating a hotfix design we suggest turning on a simulation of the cloth and then also add a "page size", e.g. A5 landscape size as in the picture below.



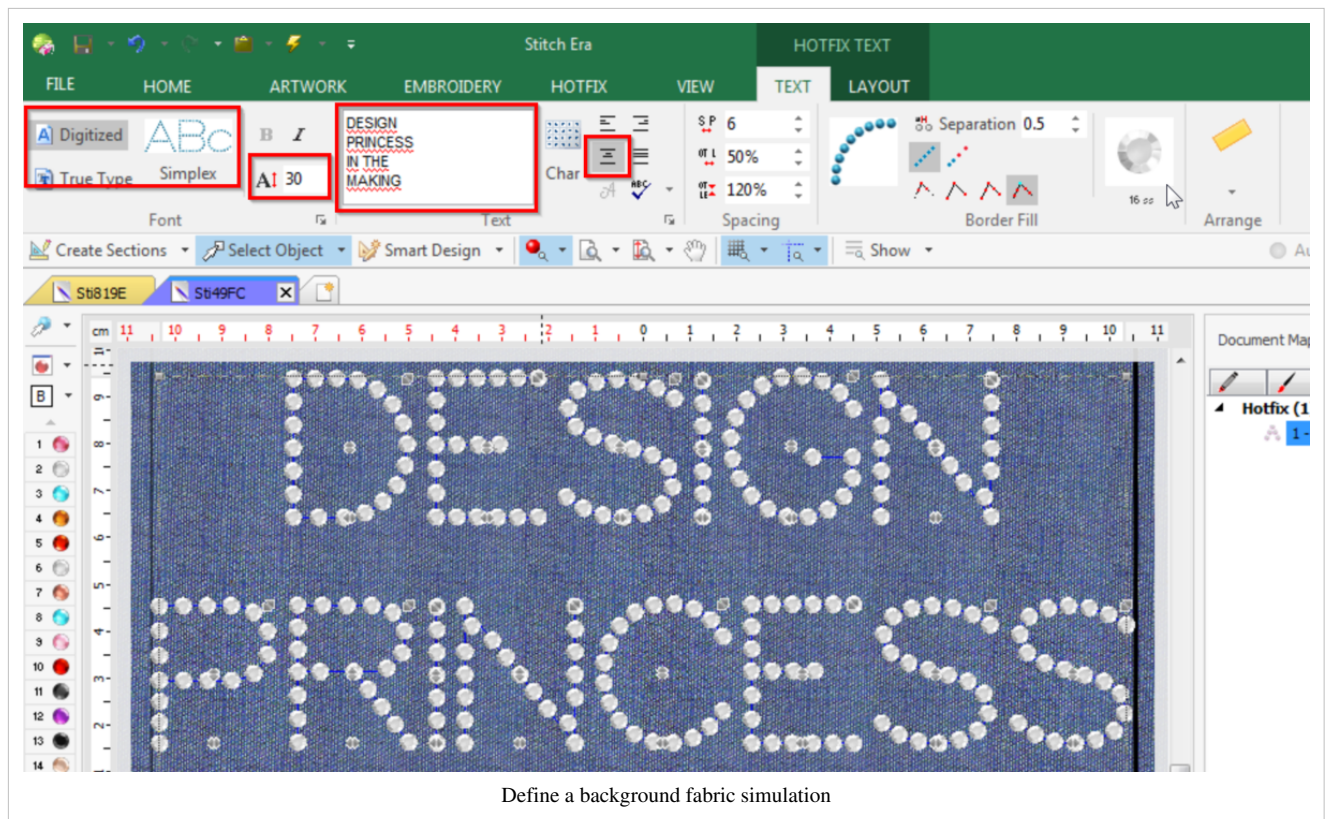
Enter the text with a nice font

For beginners, it is probably better to start using a digitized font, i.e. objects that have all the beads positioned in an optimal way.

- Click on the Hotfix tab in the ribbon menu, then click on the **Hotfix Text** icon.
- Alternatively, in the *Smart Design* Popup, open the hotfix tab, and click on the Hotfix Text icon

In both cases you now should see the Hotfix menu bar. If it does not show click on the **TEXT** that shows on the menu bar.

- To the left, in the ribbon menu bar, select **Digitized** and then choose a font.
- Enter the text in text area in menu bar (To add a new line, hit CTRL-Enter)
- Change size (30 in our case) and the alignment (middle in our case)



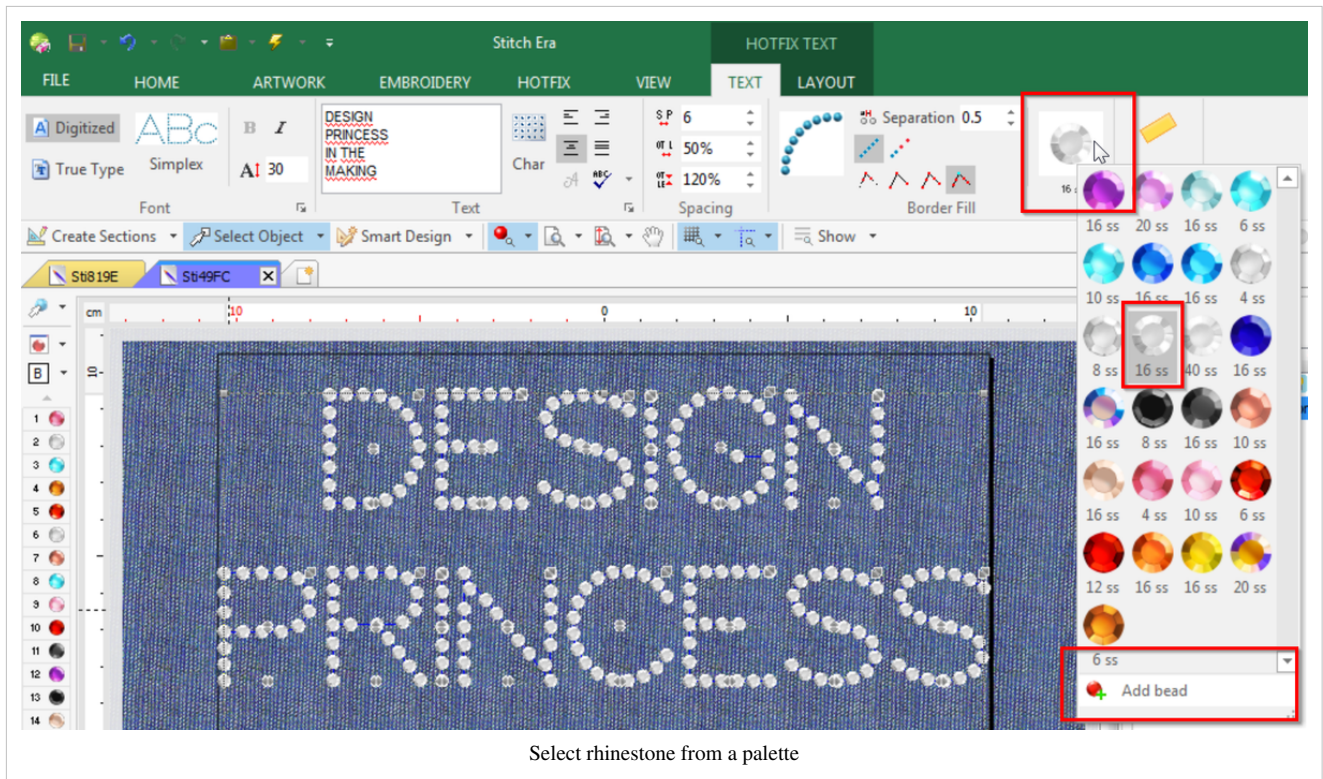
Change the rhinestone tone and size

You now should select the rhinestone size:

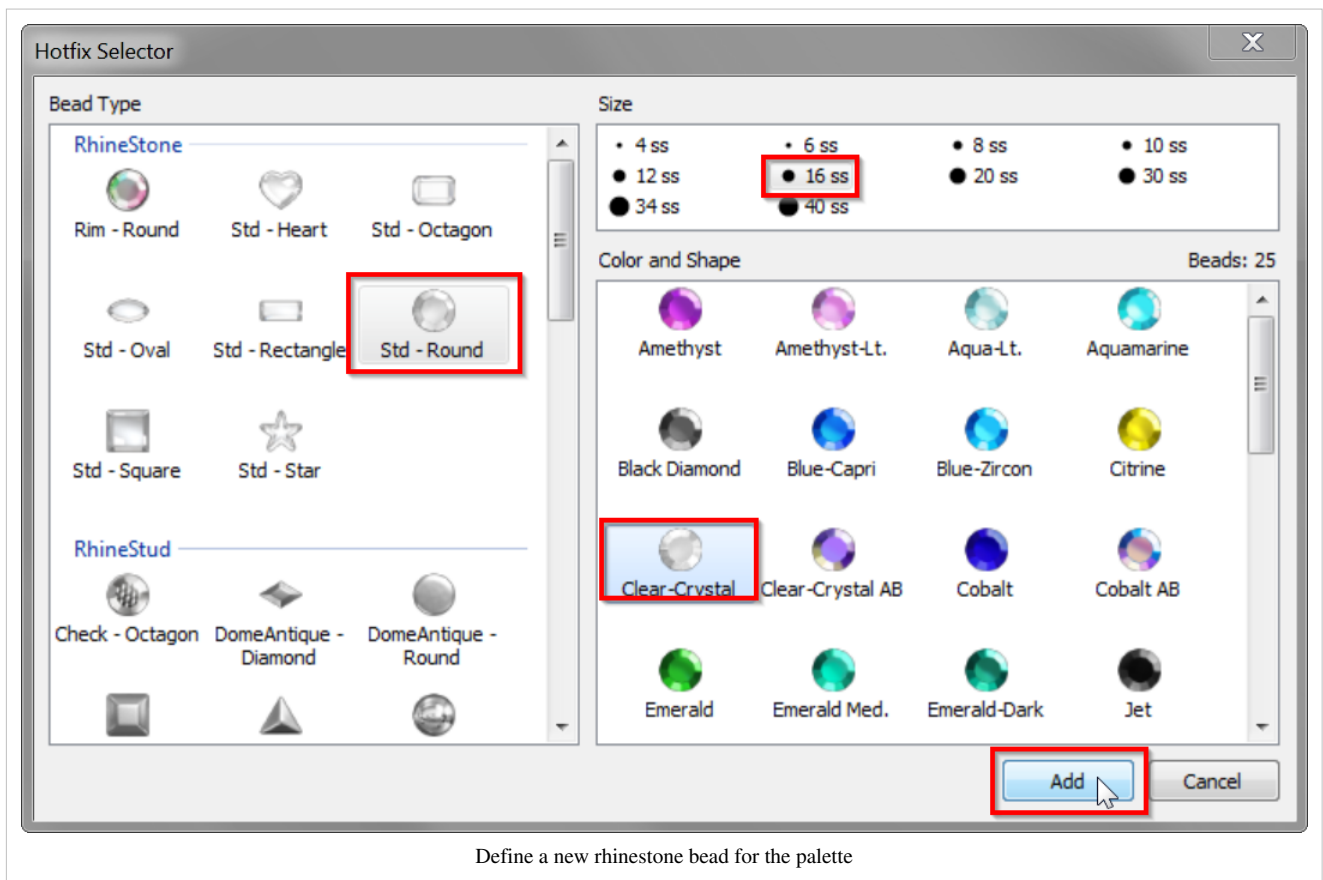
- Click on the rhinestone icon
- Select one from the popup menu that includes a default palette of rhinestone sizes and colors

Hotstone sizes are usually defined by *SS* measures. You can have a look at size definitions in the size table. For example:

- SS6 = 2mm
- SS10 = 3mm
- SS16 = 4mm
- SS20 = 5mm



If the wanted size and color is not in the offered selection, then click on **add bead** at the bottom. You will get a popup that will allow defining all sorts of colors, shapes and sizes. We chose SS16, standard shape and clear crystal color.



Now you could change many other parameters, but we find that the result as shown in the screen captures above is pleasing enough and we will stop here.

Creating hotfix designs with TrueType letters

There are two ways of lettering with true type letters

(1) Using hotfix fonts

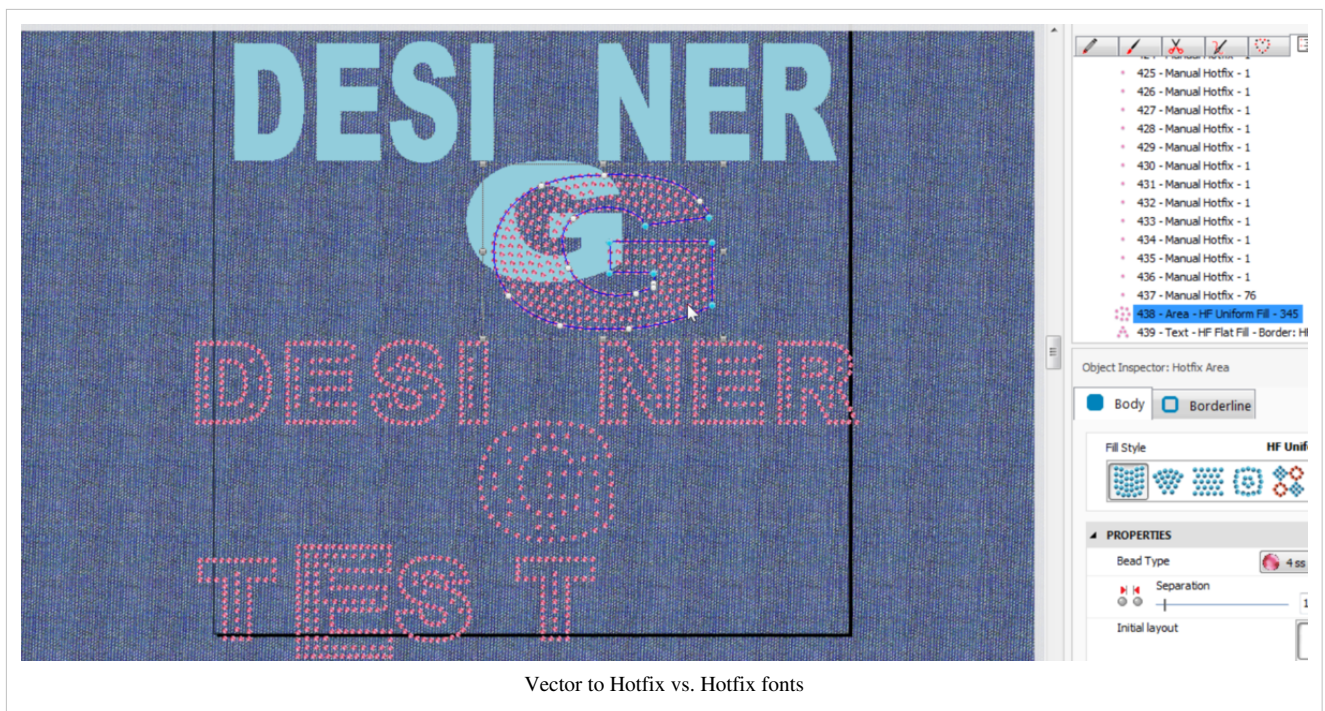
- Advantages: faster, better initial placement of beads, text is editable. It is easy to move a letter up/down or change its size as shown with the "TEST" word in the screen capture below.
- Disadvantage: Shapes of letters are very difficult to manipulate. If we understood right, one has to disassemble the design, then manipulate at the bead level. Shown with the "G" in the screen capture below.

(2) Going the vector drawing route.

- Advantages: Better flexibility in drawing the "right" shape, i.e. vector letters are more easy to manipulate. A line of text can be "ungrouped" and you then can easily change shapes. The same is true for generated hotfix objects. These are ordinary hotfix areas and can be parametrized like any other of that kind.
- Disadvantages: Text is not editable, each line must be defined separately. Generated areas are not optimised for lettering.

Both can be filled (unless disassembled)

- along the stroke defining the letter shape
- inside the fills
- both stroke (outline) and fill (inside shape).



In provisional conclusion, I'd either use digitized hotfix fonts (see previous section) or vector fonts, depending on how much I would need to modify the shapes of letters.

Export hotfix designs to a laser cutter

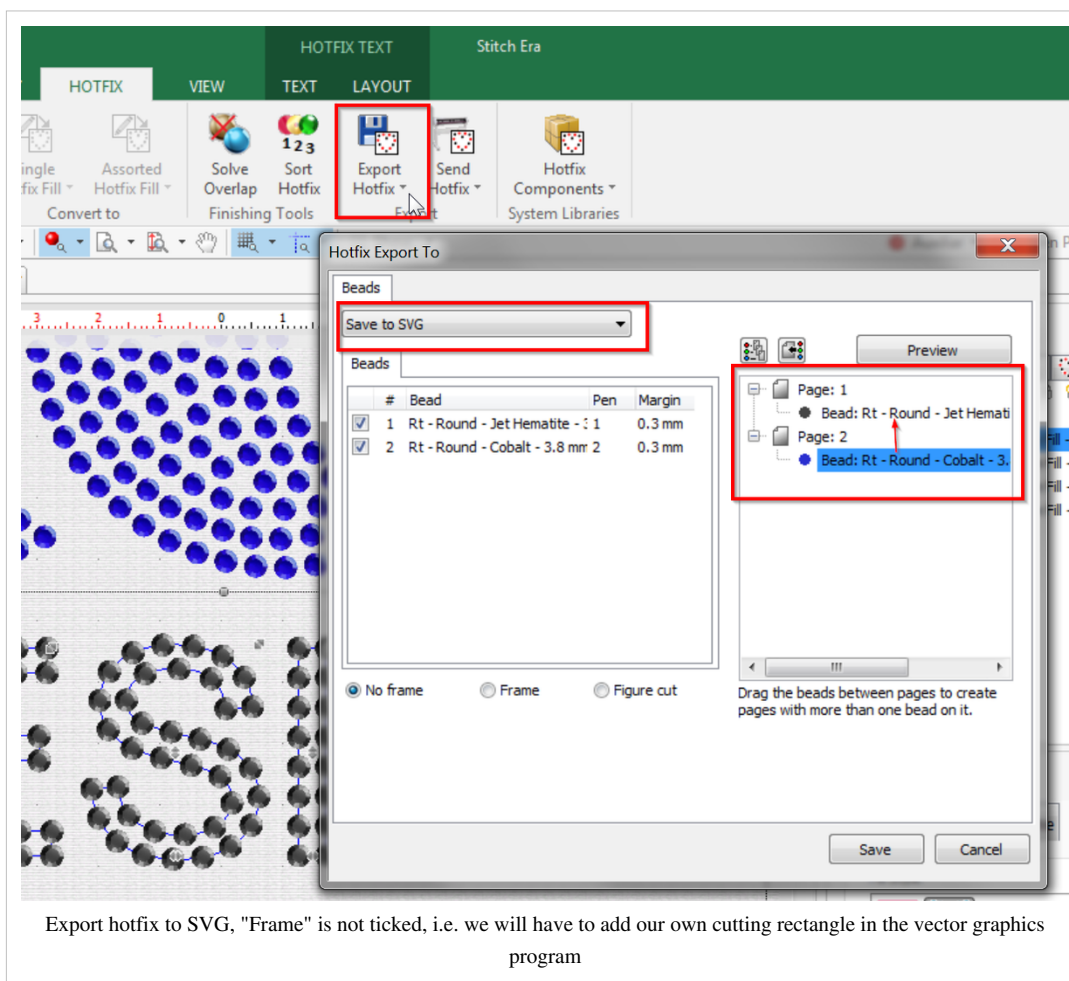
As explained above, there are different ways of using hotfix designs. Since we got a modern little laser cutter, we will export the design to SVG and then send it to the machine. The steps are fairly simple. Firstly:

Export and SVG file from Stitch Era

- Select hotfix tab
- Choose Export hotfix

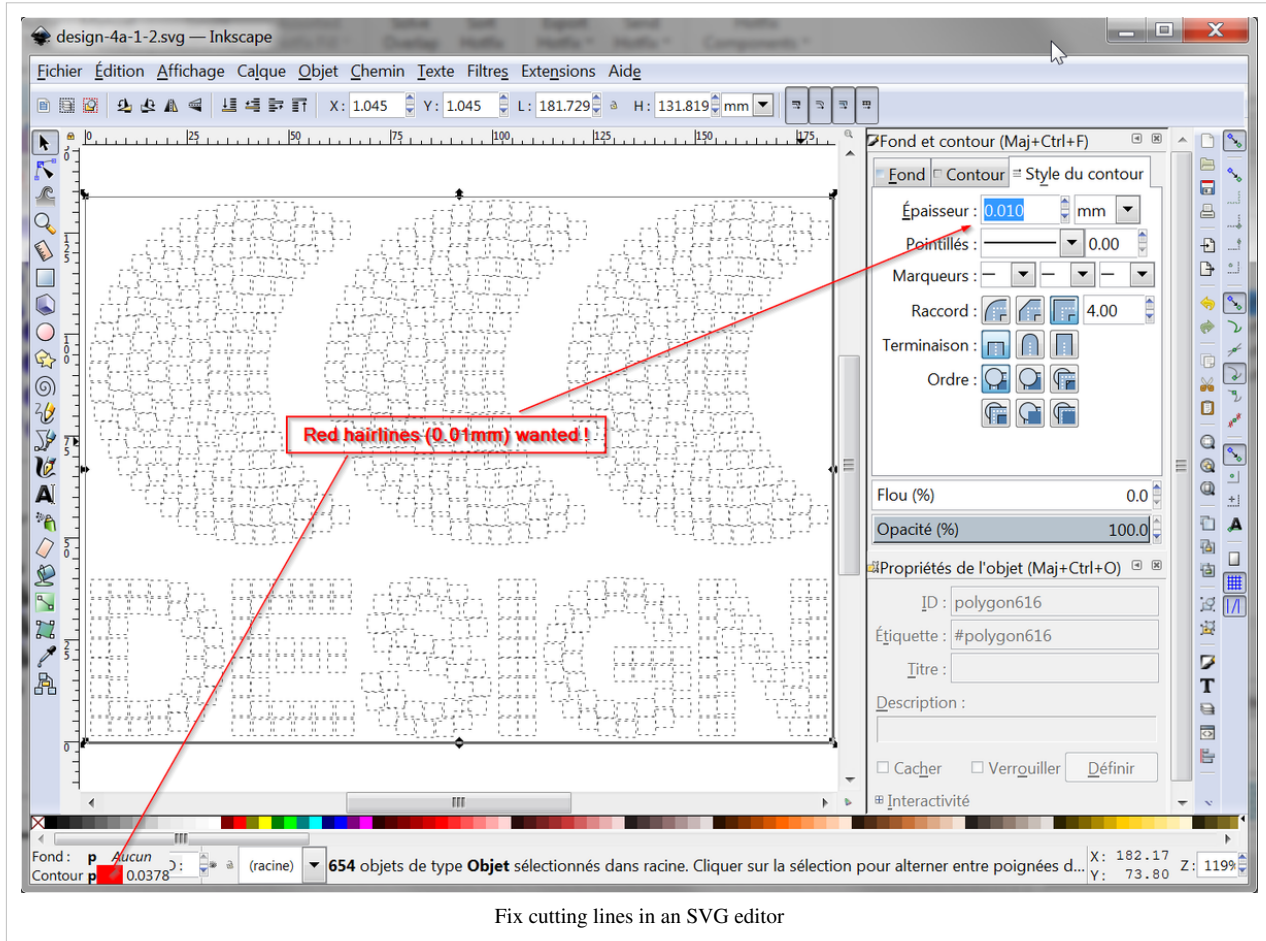
In the popup window:

- Select SVG as output
- Depending on how you plan work, you can decide to merge all designs into one page. To do so, drag all the "Bead" objects to the right into the first page. Otherwise, Stitch Era will create a different SVG file for each bead type used, e.g. that differ in size, color and shape.
- We suggest to tick `Frame` at the bottom of the popup and set a 1cm margin



Clean up the SVG for laser cutting

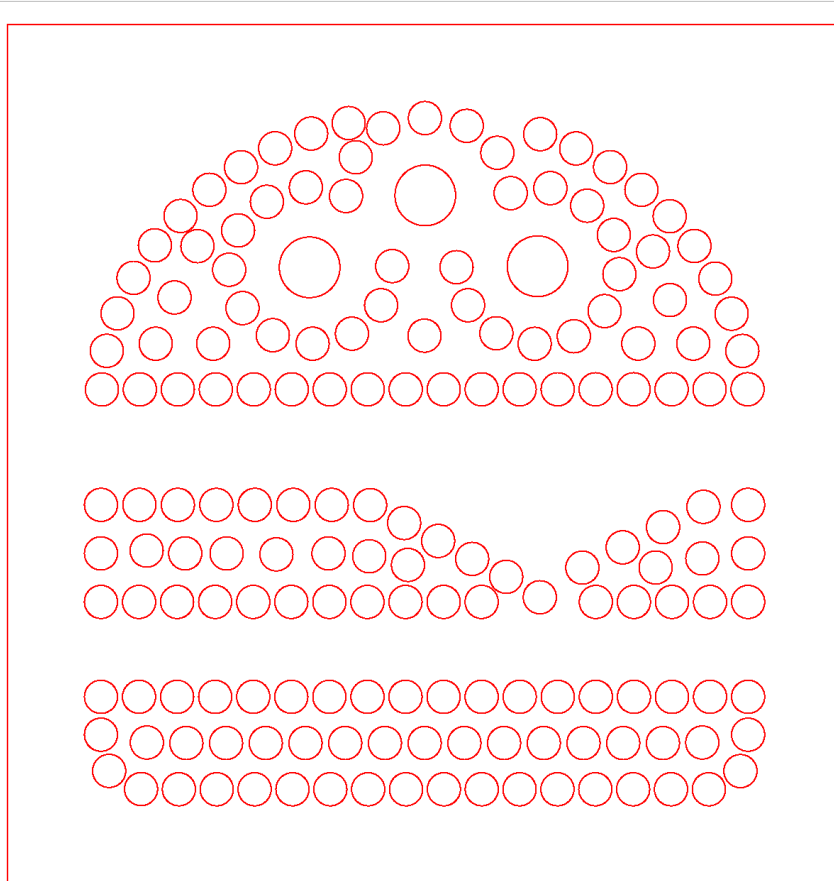
- Open the exported SVG file in an SVG editor, e.g. Inkscape
- Draw a frame (cut line of the whole template), if it was not generated by the exporter, i.e. ticked (see just above).
- Make the strokes hairline width ($\leq 0.1\text{mm}$) and choose an appropriate color (We use red (255,0,0) to define cutting lines with our Trotec)



Fix cutting lines in an SVG editor

- Check the document size. It should be at least slightly bigger than the drawing including the frame. (In Inkscape, menu File->Document Properties Resize page to drawing or selection. Make very sure to add this padding, e.g. between 1mm and 1cm to each side. Adding a larger border is easier for brushing the stones, but requires more space.

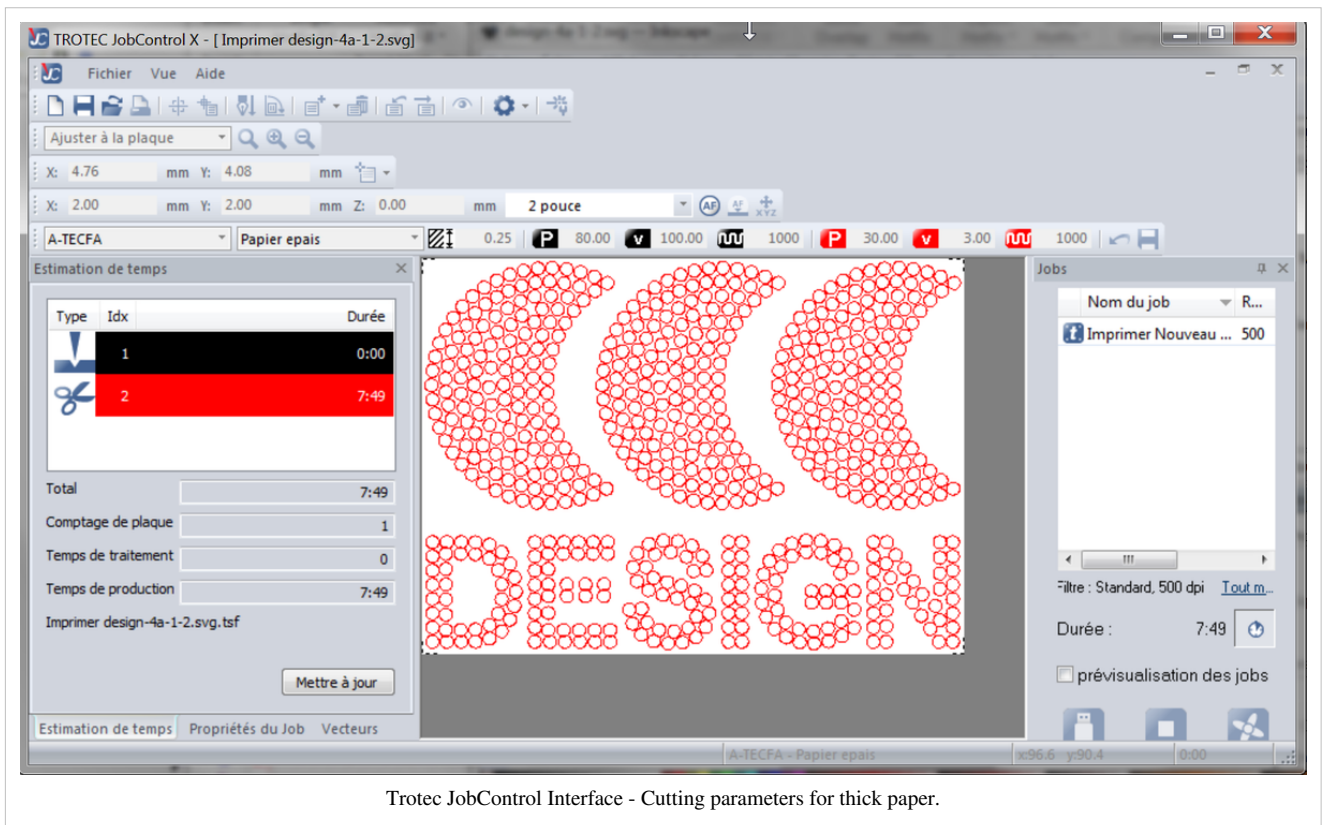
At the end you should have an SVG design that includes the cutting lines for the holes and the template itself. Below is an example:



Read to print SVG hotfix template. Click and click again to retrieve the SVG if you want to use it yourself

Send the file to a laser cutter

- Send to the cutter and select material type and thickness.



Example template

The result of the design discussed above is shown with the two pictures below. The cardboard template is too thin, but it was just a test. I probably will use 0.8 mm Acrylic and also make the extra radius a bit small. A good laser printer is fairly precise, more than a cutting plotter.

I also got an overlap warning in Stitch Era that I ignored. Such errors can either be fixed manually or automatically (click on Solve overlap). Heavy overlap must be solved. One also can very slight augment the distance between stones. The default is 1mm I believe.

7 Export hotfix designs to a laser cutter [[edit](#) | [edit source](#)]

As explained above, there different ways of using hotfix designs. Since we got a modern little laser cutter



Hotfix template printed on some random cardboard



Hotfix template partially filled, holes are rather large for these SS16 - 3.8mm stones

Using the template with a heat press

- Read the hotfix stone article and maybe the description of the heat transfer press used at TECFA.

References

- [1] <http://www.stitchera.com/downloads/Documents/Era1140-9.pdf>

Stitch Era - creating embroidery with hot fix stones

Introduction

This beginner's tutorial for the Stitch Era embroidery software explains how to create embroidery designs that include hotfix stones.

Tutorial home page

Stitch Era embroidery software

Learning goals

Digitize a vector graphic into an embroidery plus hotfix stones

Prerequisites

Stitch Era - creating embroidery from vector images

Stitch Era - creating hot fix designs

Related pages

Hotfix stone

Materials

You can reuse the pictures. In the wiki, click on picture to make it larger, then click again and save it.

Quality and level

This text should technical people get going with Stitch Era. I use it for an optional master degree course in educational technology.

Last major update

October 2017.

This tutorial will combine some concepts and procedures from two other other tutorials, i.e. Stitch Era - creating embroidery from vector images and Stitch Era - creating hot fix designs. We will go through two simple examples. In the first, embroidery dominates, in the second hotfix stones are more important.

Rocket Example

Let's create a little rocket with nice crystal windows. We can find one on OpenClipArt

- Download Rocket icon ^[1] By pitr
- Make sure to get the SVG file, e.g. click on the picture and then save as.

Resize the rocket in Inkscape

Since the Rocket is fairly small we would like to make it bigger, i.e. make it fit into a 10cm by 10 embroidery hoop. According to our experience, scaling works better in a vector editing tool. However, as you shall see, the result won't be usable, but for a mysterious reasons, scaling the drawing before does something good.

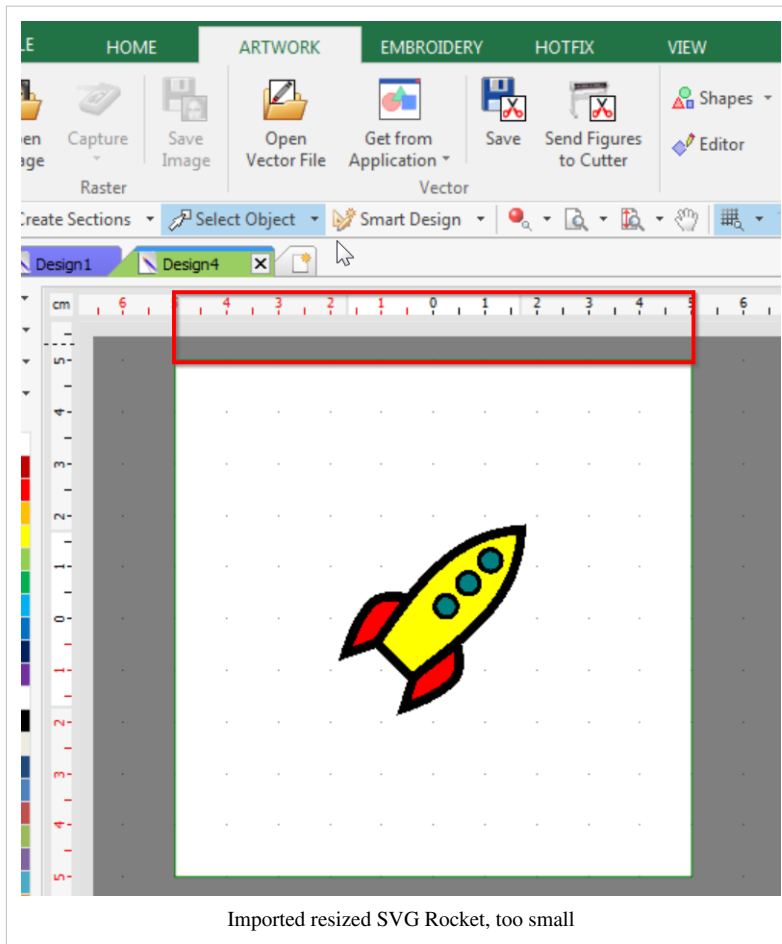
- Open the Rocket in Inkscape
 - Select all, ungroup
 - Open the transform menu (CTRL-SHIFT-m or Menu Object -> Transform)
 - Tick "scale proportionally"
 - Enter 95mm or 40 mm if you prefer a smaller size. 9.5 x 9.5cm can be considered a fairly large embroidery for this type of drawing.
-

- Save the file as plain SVG.

Import the scaled SVG rocket to Stitch Era

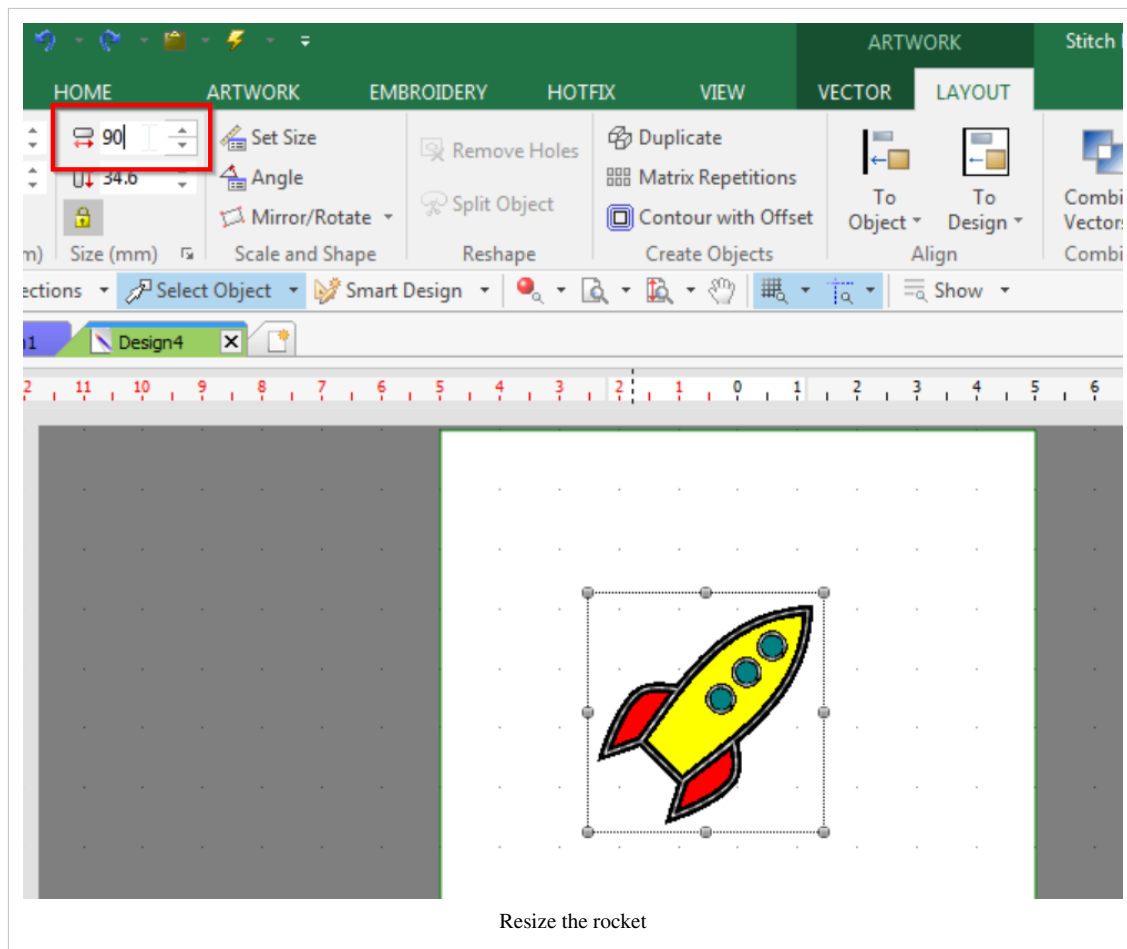
- Define a hoop size. We suggest 10 x 10cm

Artwork tab -> Open Vector file. You now should see the rocket. As you can see, Stitch Era does not take into account scaling using viewports as Inkscape does.



Adjust the size in Stitch Era

- Click on the rocket (do not use CTRL-A)
- Ungroup (using either the context menu or Artwork->Layout tab->Ungroup ALL)
- CTRL-A
- Artwork->Layout tab
- Set width to 90 (not 95, because we will need some extra space) or less, e.g. 40 if you want a small embroidery.
- Reposition in the middle (You can use the **To Design** tool in the ribbon bar, i.e. align horizontal and vertical with respect to the Design, i.e. the hoop).

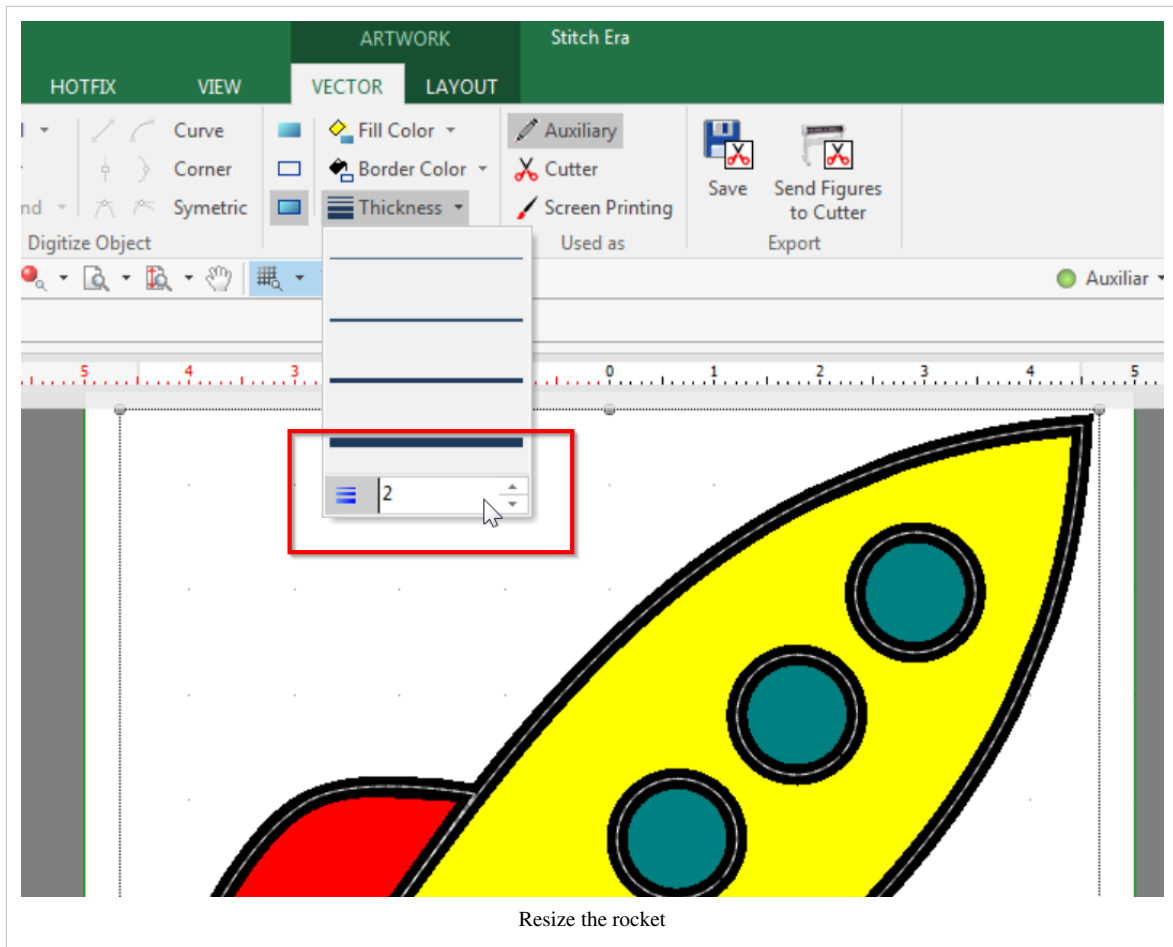


Save the file as, e.g. rocket-1.dsg

Adjust the size of the borders

The black borders of the parts (i.e. yellow body, blue windows and red fins= are too small for nice satin stitches. Let's make them just a bit bigger for now, i.e. 2mm.

- CTRL-A
- Vector Tab
- Set thickness of lines to 2mm as shown in the screenshot below.



Save the file as, e.g. rocket-2.dsg

Flatten the drawing

This is not totally necessary for this rocket, since only the windows will overlap the yellow area. But make sure to recall this in case you work with another rocket. Most often vectors drawings use several shapes that are piled on top of each other. In embroidery, one normally uses single layers (plus a bit of underlay), otherwise the stitched design will get very stiff and can break needles, etc. Anyhow, in our case we also will "carve out" the windows from the yellow body.

- CTRL-A
- Layout Tab
- Combine vectors -> Simplify

After simplifying vectors you may have to add some overlap again in cas the test print shows that embroidery areas have some empty space (e.g. tissue showing through) between sections. But that is a matter for more advanced users.

Digitize the rocket

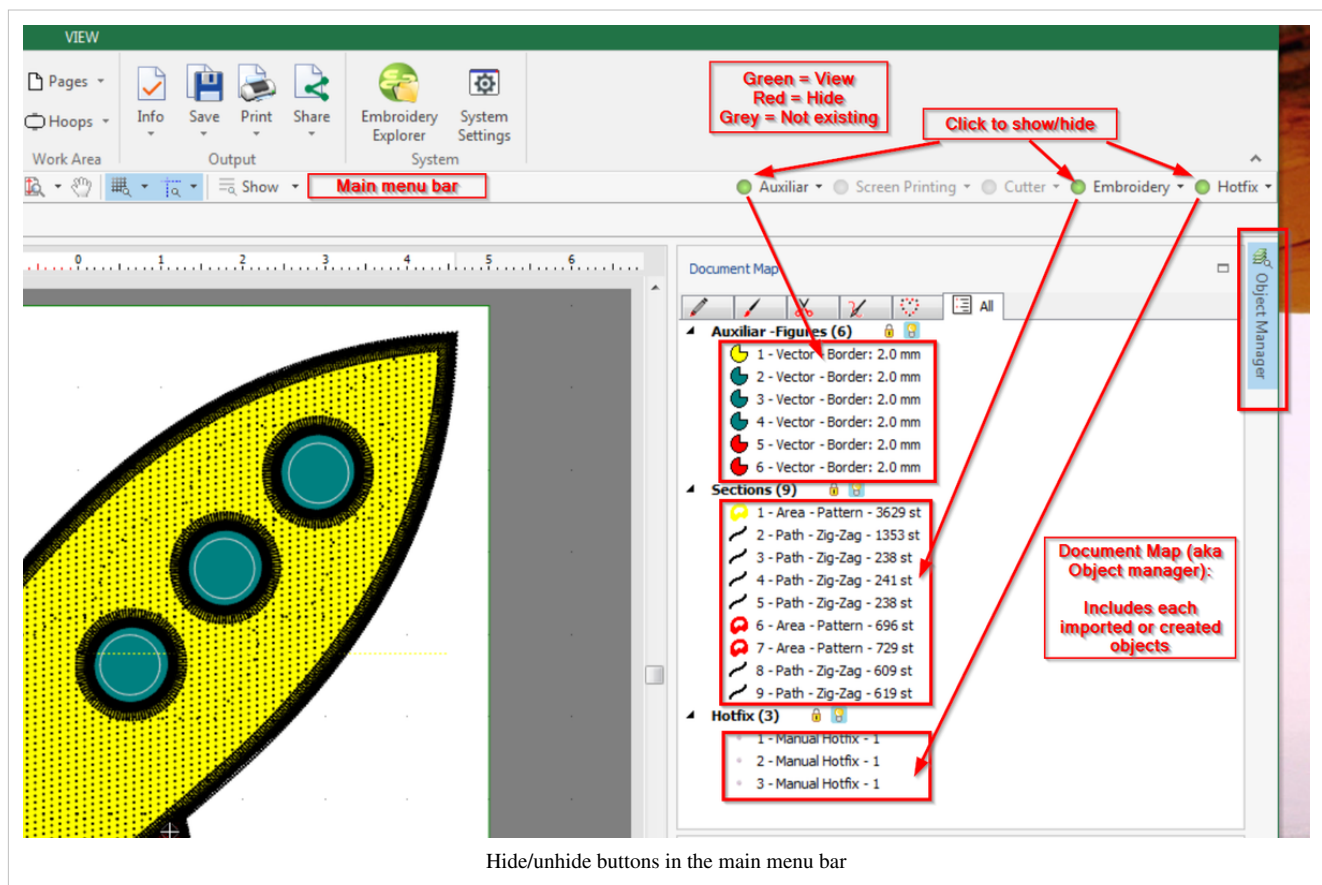
Now let us translate the drawings to embroidery objects. Read the Stitch Era - creating embroidery from vector images tutorial first, if you don't understand the concept. Below we just outline the steps.

- CTRL-A
- Embroidery tab
- Art to stitch
- Select Art to stitch (intelligent)
- Select Objects to fill -> Fill Areas and Borderlines (we do want to keep the black borders)
- Select Artwork Unaltered (or process overlaps if you didn't simplify your geometry)

To verify the result, tick on Embroidery. If stitches are not yet generated, then hit F9 (or FN f9 on some computers) or the lightening icon on top. Verify if the black borders overlap with the yellow and red parts. In principle they should. Otherwise, make them bigger.

Save the file as, e.g. rocket-3.dsg

Before you move on, we just would like to recall that you can hide or show various types of objects, i.e. **auxiliar** (includes the vector graphics), **embroidery sections** and **hotfix** designs. The main menu bar below the ribbon menu bar includes buttons that you can tick on or off for viewing / hiding. If the button is greyed, objects do not exist.

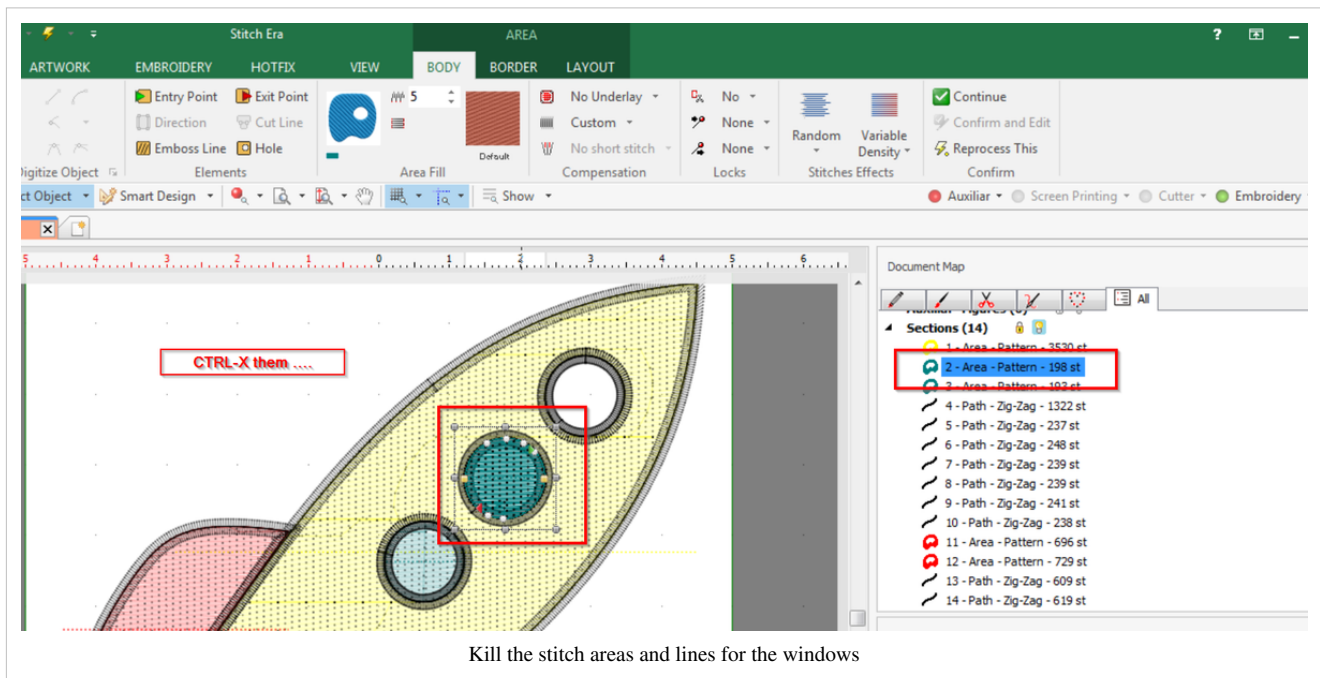


If you are unhappy with the stitching, you can change the parameters of the various stitch sections (see the Stitch Era - adjusting stitch sections tutorial). You also can kill all the Sections and start digitizing again. Warning: Each time you digitize a vector object it will create a new stitch (or hotfix section) and keep the old one !

Remove the stitched rocket windows

As planned, we would like to use hotfix stones instead of embroidery for the windows.

- Untick *Auxiliar* in the menu bar. Since you need to preserve all the vector drawings for the windows it is better to hide the drawings. This way cannot kill any by mistake !
- Open the Object manager (to the right, see the previous screen capture). You now can see the document map panel to the right.
- Kill the blue window stitch objects
- You also can kill the black circles surrounding the blue window. As you can see by clicking on the black path in the Object Manager, we got two times three borders. One times three borders is enough, unless you do want doubly stitched ones.

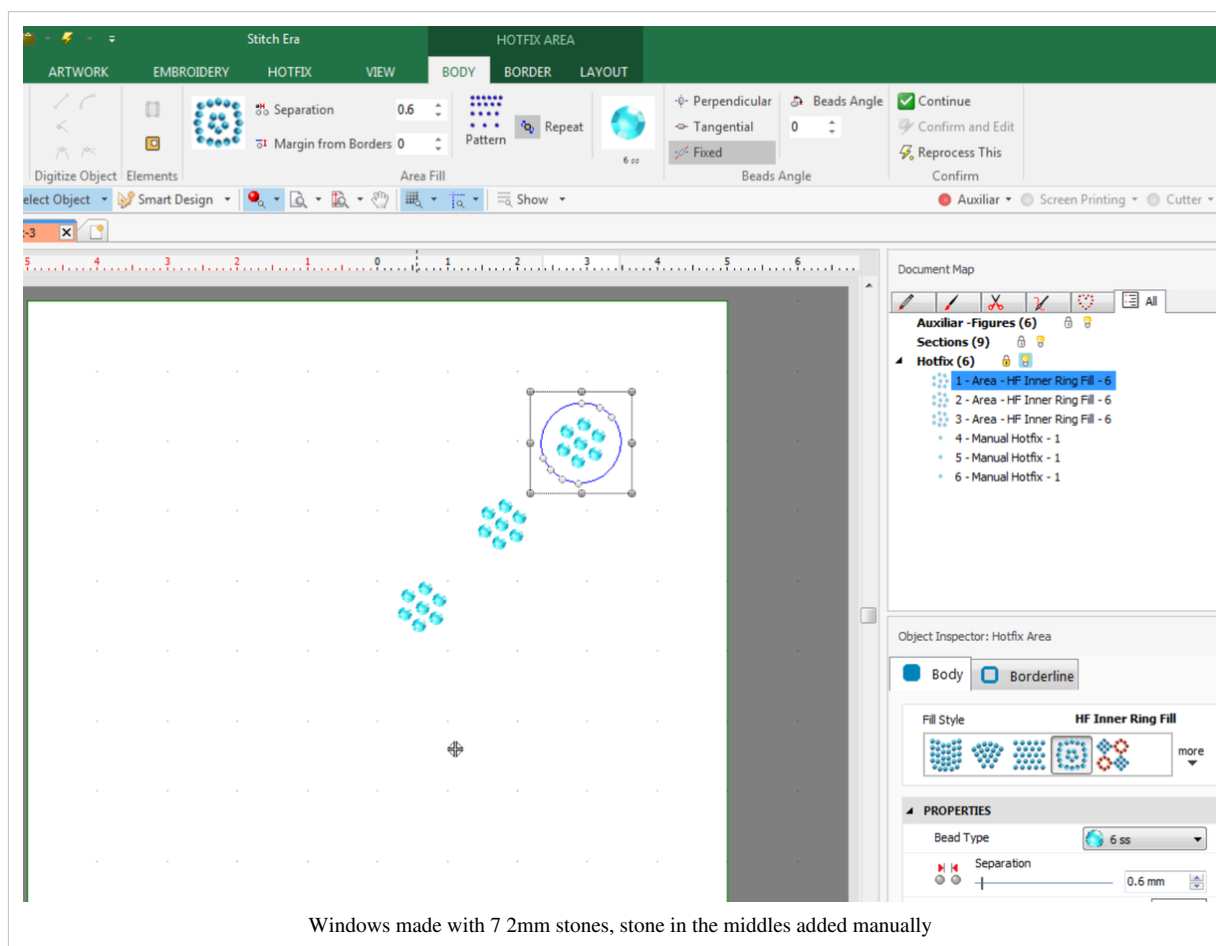
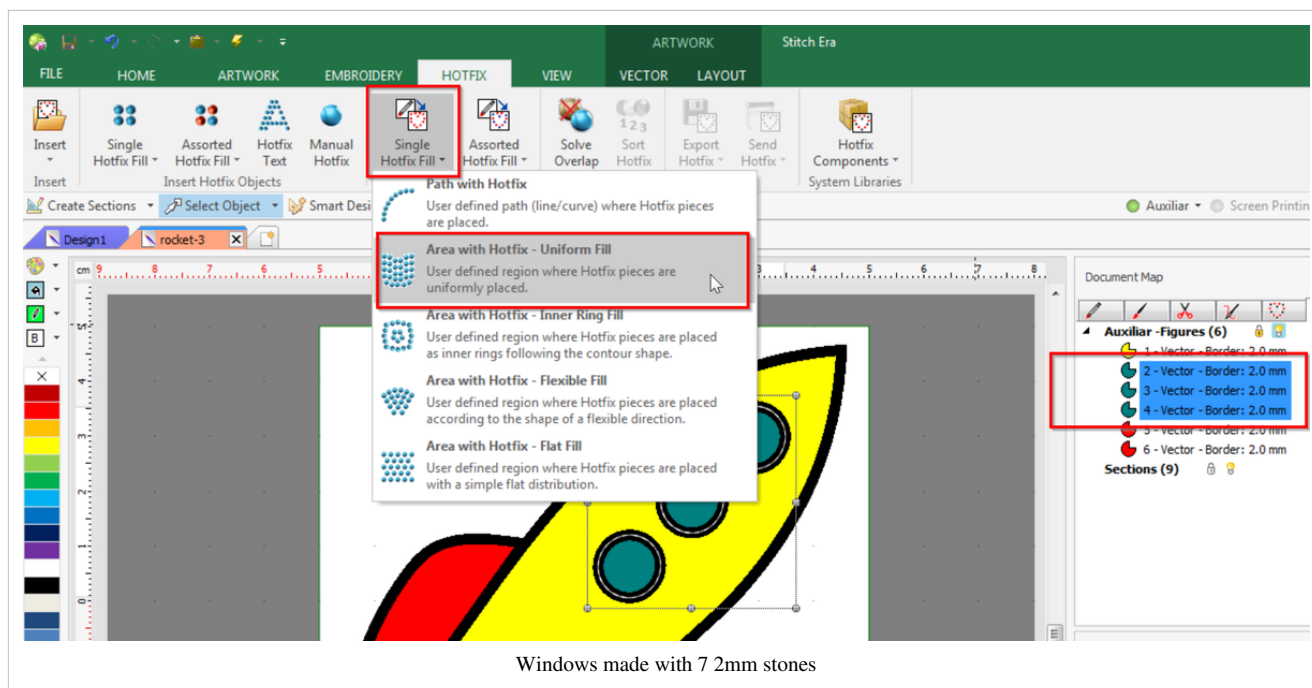


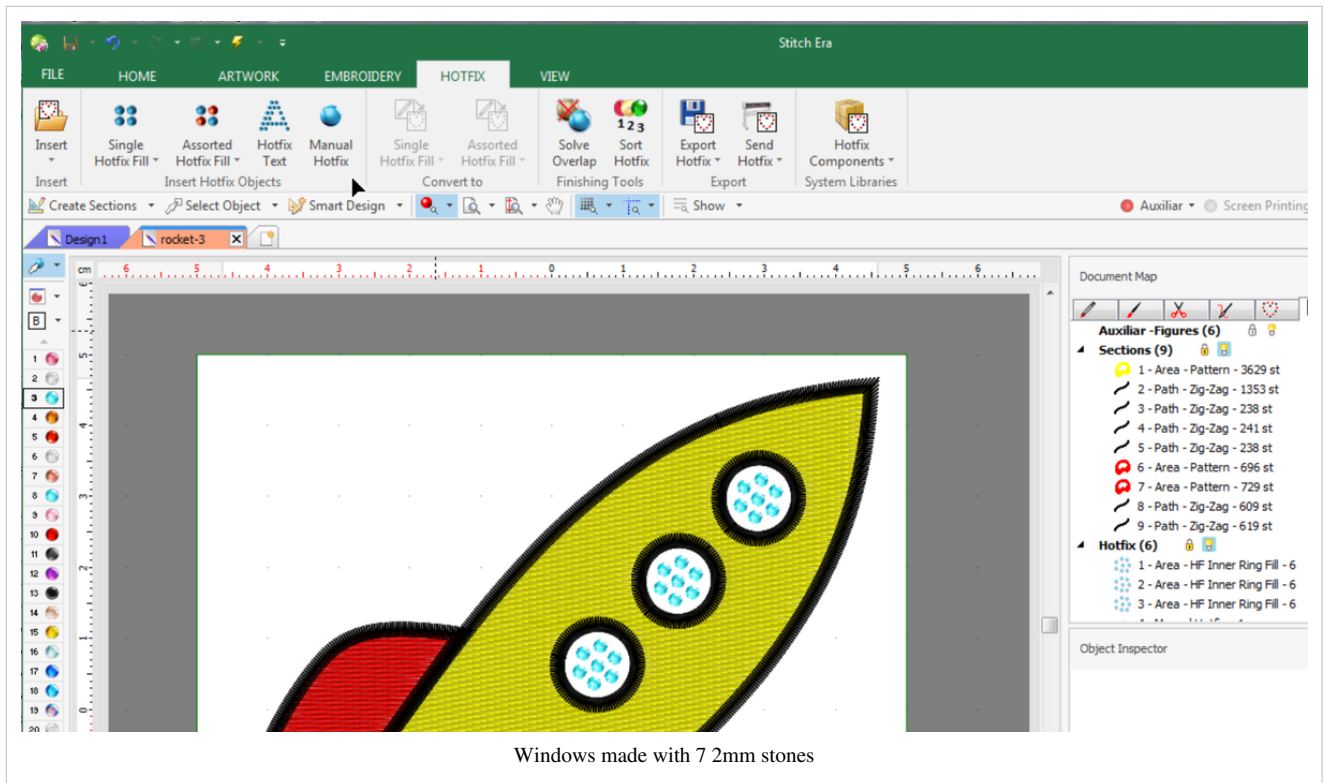
Now, to create the windows, you either you could a single SS34 stone for each window or many tiny ones, e.g. SS6 (2mm).

Option A: Add small hotfix stones

You now can fill the windows of the rocket with a few small hot fix stones. Else if you only need on large stone, jump to the next section.

- Tick *Auxiliar* and untick *Embroidery* in the menu bar
- Select the three windows (hold down the CTRL key while you select one by one)
- Open the Hotfix Tab
- Menu Single Hotfix fill -> Areas with Hotfix - Uniform fill
- Untick *Auxiliar*
- Select the three hofix areas
- Set the stone size and other parameters. The following picture shows SS6 size, 0.6mm distance, and *HF Inner Ring Fill* pattern. You also could manually add a stone in the middle (see below)
- Tick the embroidery tab to see the result.

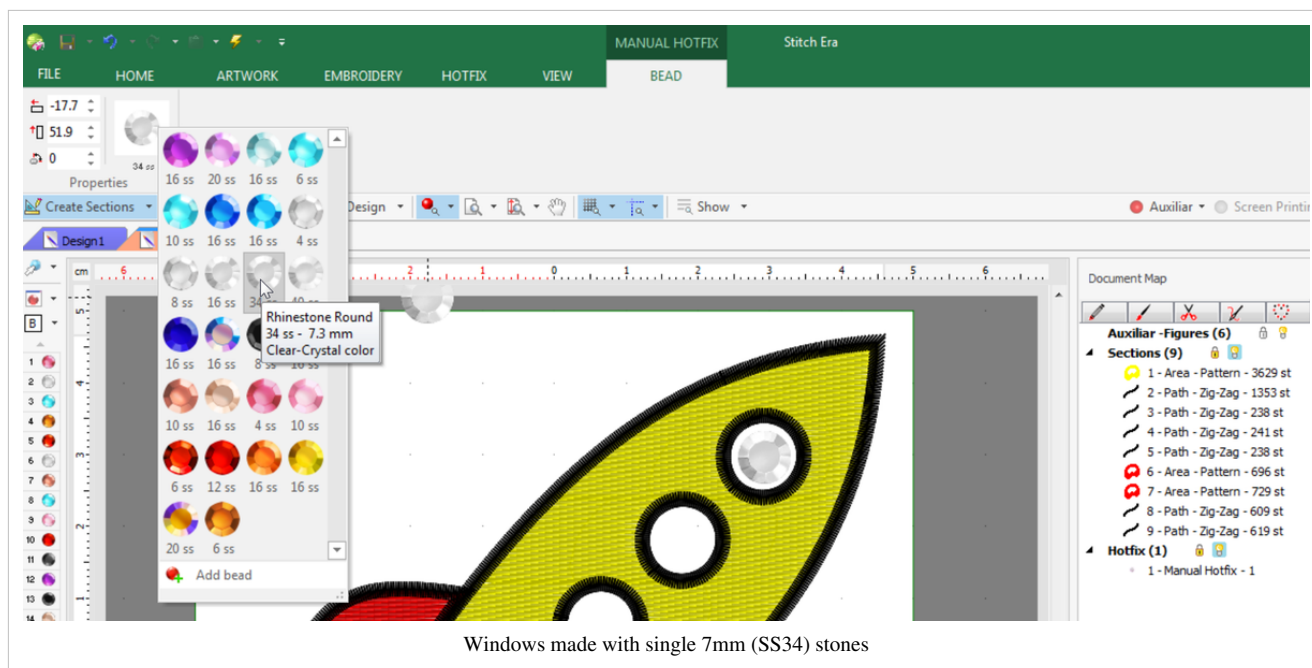




Option B: Add a single stone for each window

Adding individual stones and editing is explained in more detail in the Stitch Era - creating hot fix designs tutorial.

- Untick Auxiliar and Embroidery and tick Hotfix
- Kill all the hotfix areas
- Tick Embroidery
- Hotfix Tab
- Click on Manual
- Now a bit tricky: Open Manual Hotfix / BEAD tab before clicking and select the right stone size. If it is not in the palette, you can add it using "Add bead".

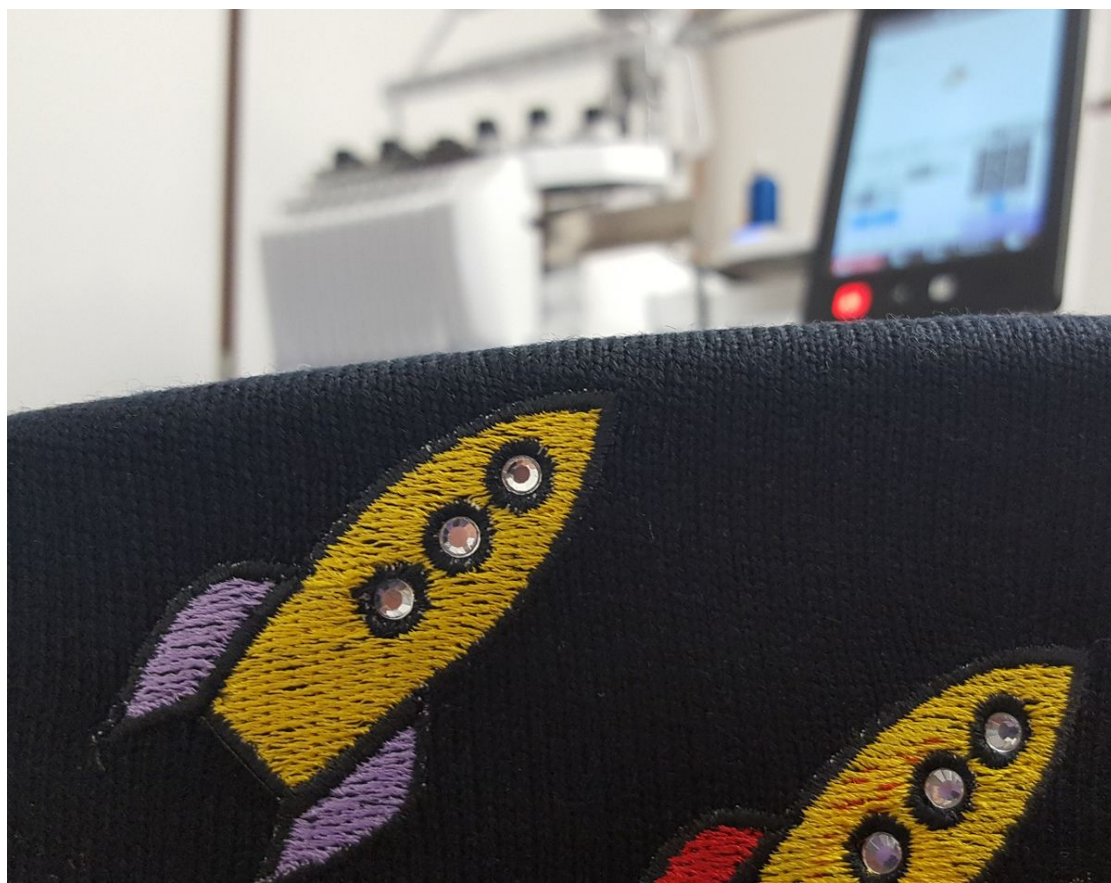


- To fine tune positions of stones, use the Edit Hotfix menu (on top of the stones palette to the left)
- To exit manual setting or edit hotfix, open another tab and click on something.

Read *Stitch Era - creating hot fix designs* for some more explanation.

A result

The following picture shows an example of my private main use for embroidery: stitch holes in sweaters (pullovers). This one had two moth holes. But I like it simple. The small rockets are 4cm in size, i.e. fit into a small 5x5cm hoop of our Brother PR1050X with some space to manoeuvre. After embroidery, I just put this Merinos wool sweater in the heat press on top of some baking paper. I then added the hotstones manually, put some baking paper on top and then pressed at 200C for 20 seconds.



Rockets with crystal windows on Merinos Wool

To improve: The rocket was too small to cover one of the moth holes, so I had to stick a second one over the first one with a result that is frankly not professional. However, the sweater is usable again. Tip: When you design something to cover a moth hole make it rather round and have stitches overlap, i.e. not "empty" spaces. Also make sure that it is at least four times as big as the hole and that you can reposition the embroidery with the control interface (to avoid rehooping if the position is a bit wrong). Instead of taking a practical 5x5cm hoop, consider using a 10x10cm hoop.



Overlapping rockets with crystal windows on Merinos Wool

We also might have used some denser fill (right now the yellow, red and violet parts are 5 lines/mm) or put some product on the wool to flatten it down.

Hamburger Example

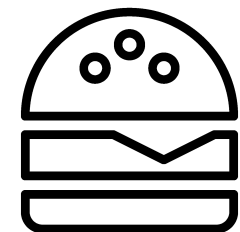
This example shows how to combine hotfix areas with some embroidery lines. We shall create a hamburger with a little monogram inside.

Import and arrange vector file

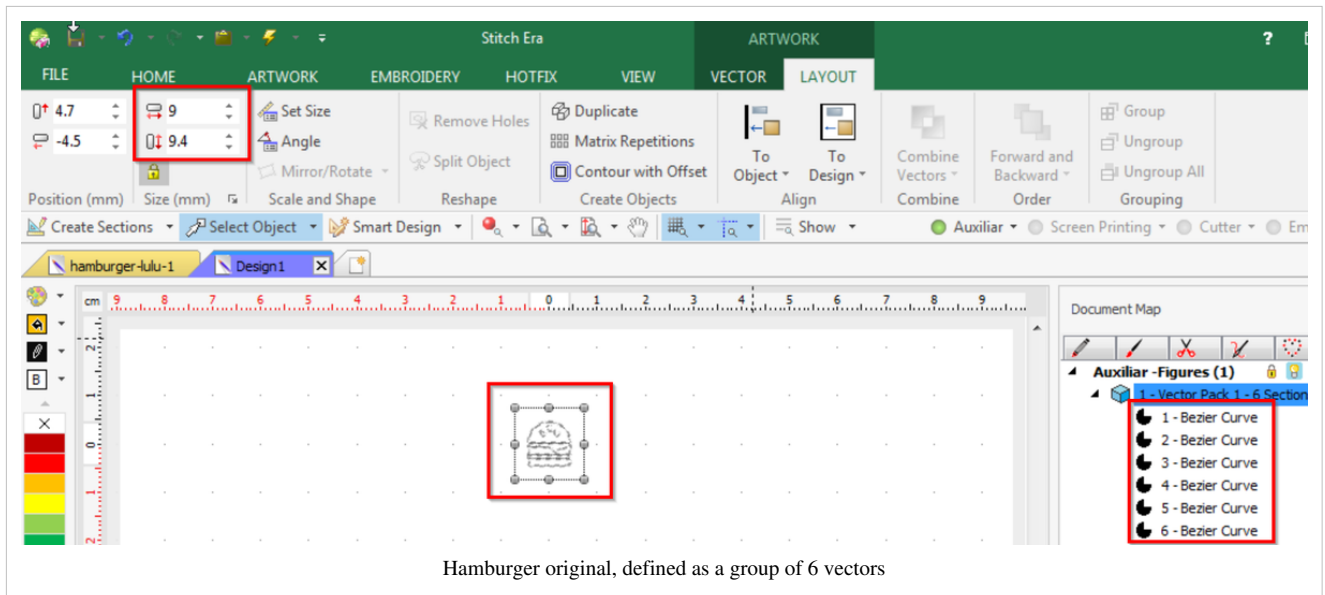
The Nounproject ^[4] is very useful site that includes over a million icons. If you acknowledge the author you are allowed to use any icon for your own use, **but you do have to register** (it is free). If you pay 40\$/year (half for education) you can use these freely and more easily. Of course, I do pay an annual fee since I use these fairly often and since such initiatives should be supported.

- Get file 317585 ^[3] from the noun project (and **register** if not already done so). If you cannot do this, you can take it from the picture to the right (click three times on it until you land on the SVG page, then "save it as"), but please understand that you will have to acknowledge the original author.
- Import to Stitch Era: Artwork tab -> Open Vector file

If you do have a noun project membership (40\$/year/or less) you will see this (otherwise you will have to remove something): A really small hamburger: 9x9.4mm. We want ours at least 10 times as big. We also want to ungroup the elements.



Cheeseburger icon.
Copyright Mikicon ^[2],
downloaded from 317585
^[3] by DKS, reproduced
with permission

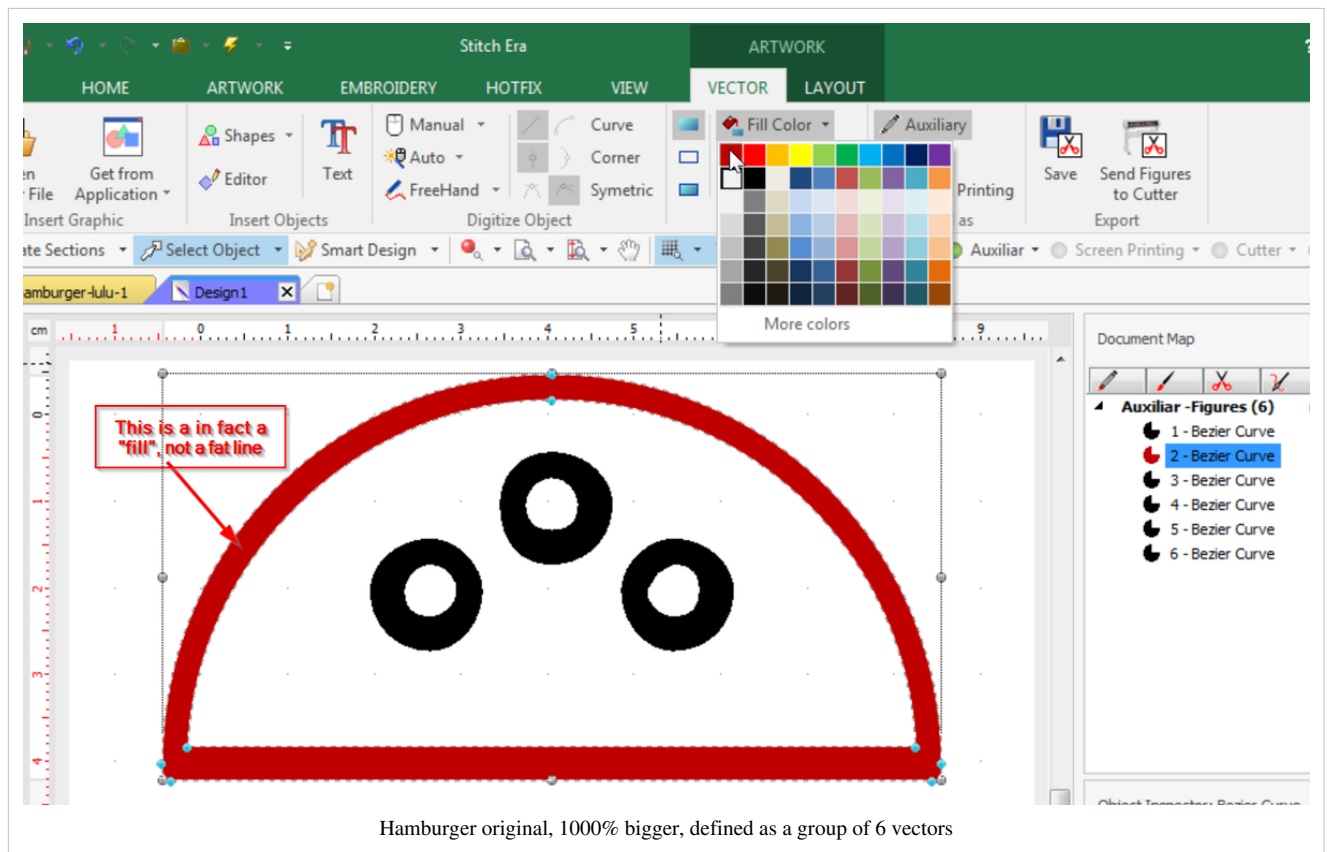


- Now, select all (CTRL-A),
- Artwork -> Layout tab. Enter 90 for the width (left in the ribbon menu)
- Select the object, i.e. click on it
- Ungroup, either in the right-click menu or in Artwork->Layout; Ungroup All button to the right in the ribbon menu

Adjust the view so that you can see all the objects

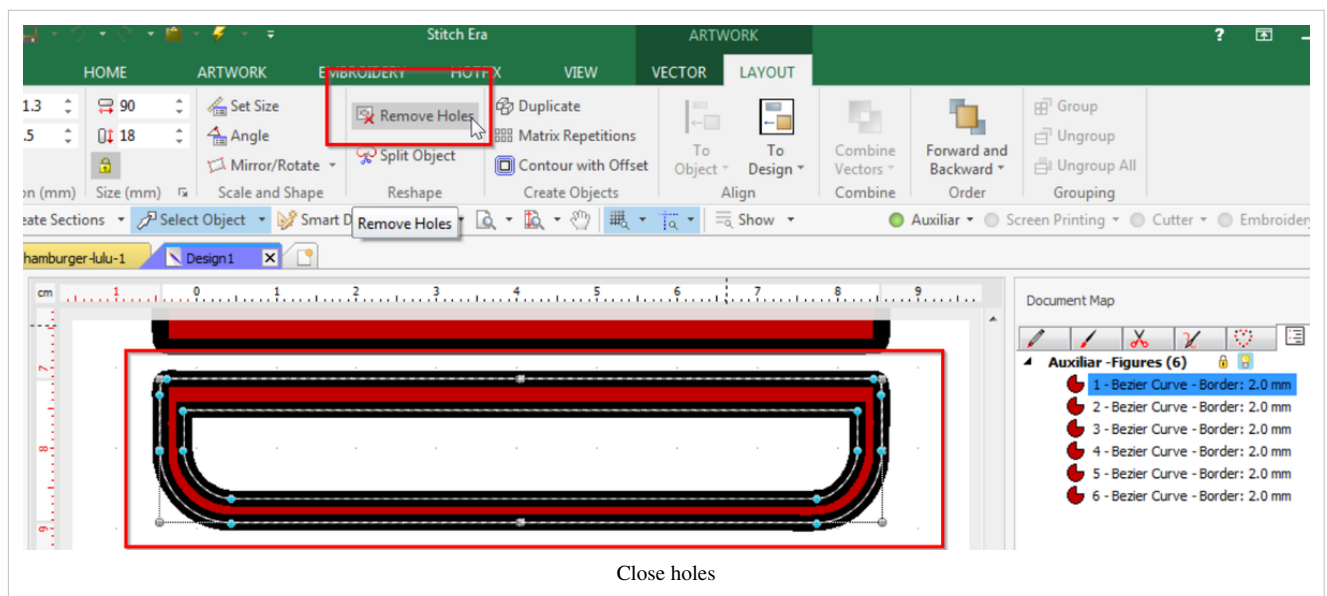
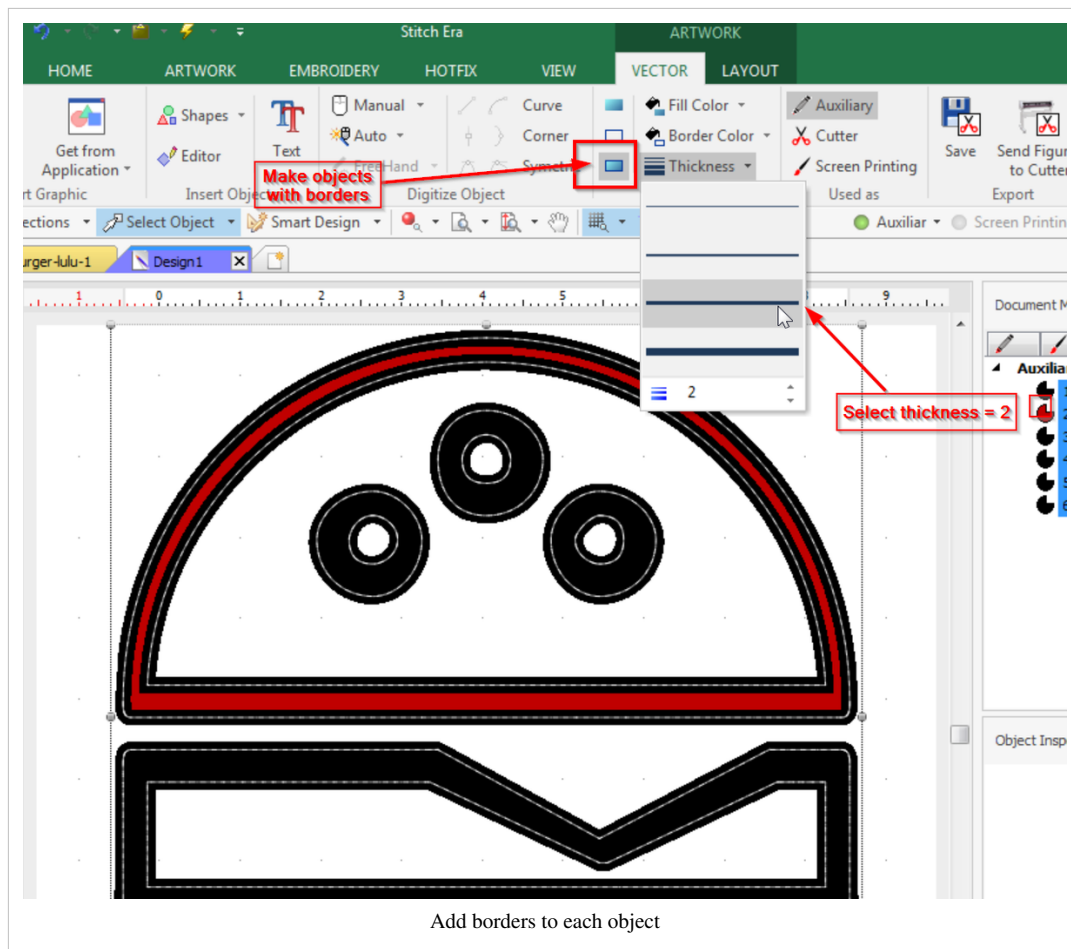
- CTRL-A
- F6 (or FN-F6) or click the Zoom Area button in the main menu bar

Click on one object. You can see in the ribbon menu that (a) the lines are vectors and (b) that they are not really lines (as in strokes) but fills without borders (strokes). If you like, you can change its color as shown in the following screen capture.



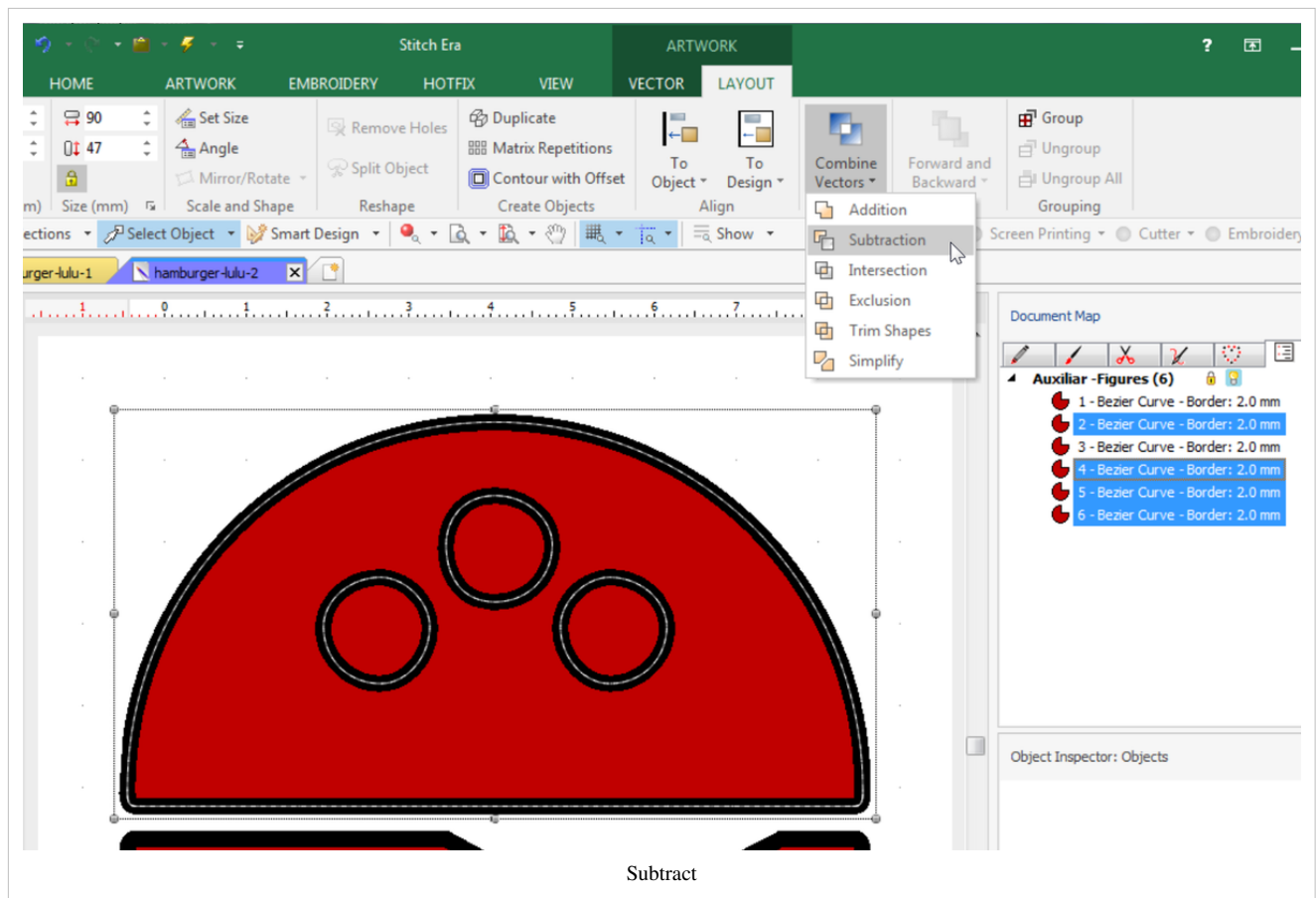
In order to fill these objects with hotfix stones we will have to transform these curves into solid surfaces. There are several ways to do this. In Stitch Era we simply can remove "holes".

- Select all objects
- Make them objects with borders
- Set the thickness to 2.
- Now for each of the six objects: Select each one and click on "Remove holes" in the Layout tab. I suggest opening the object manager on the right and then click on the items in the list one by one.



Now we shall subtract the three rounds from the bread on top:

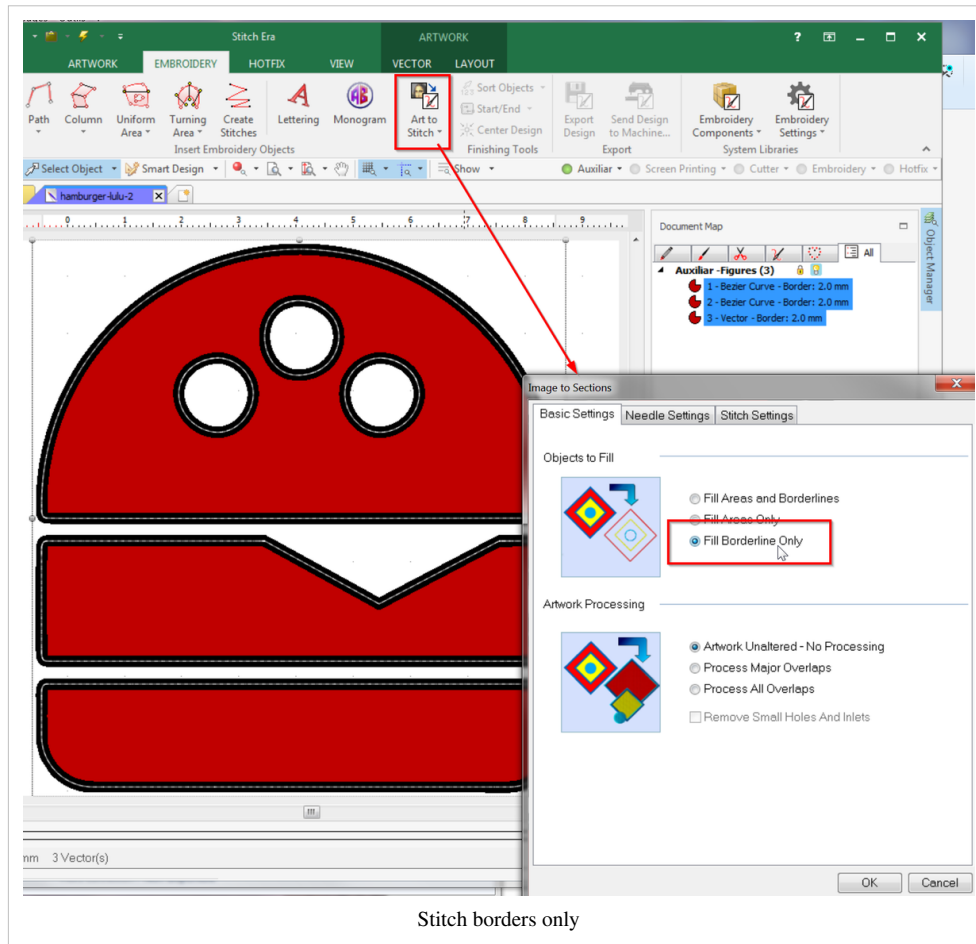
- Select the top "bread" **first** (this is important), then select the three round "holes"
- Layout tab -> Combine vectors -> subtract.



Now we have only three vectors left that we will translate to stitch objects.

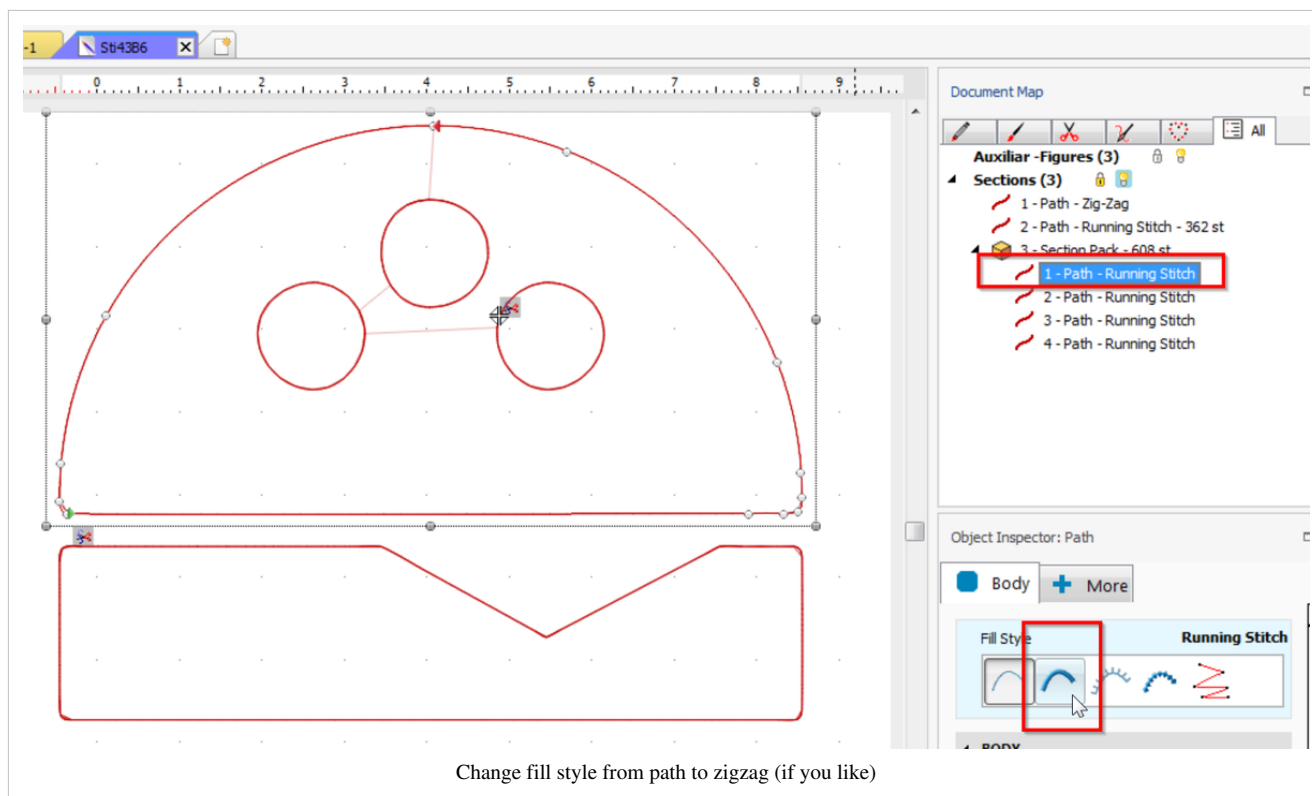
Transform the borders into embroidery

- CTRL-A
- Select Embroidery tab
- Art to Stitch -> Art to Stitch (intelligent)
- Select Fill Borderline Only



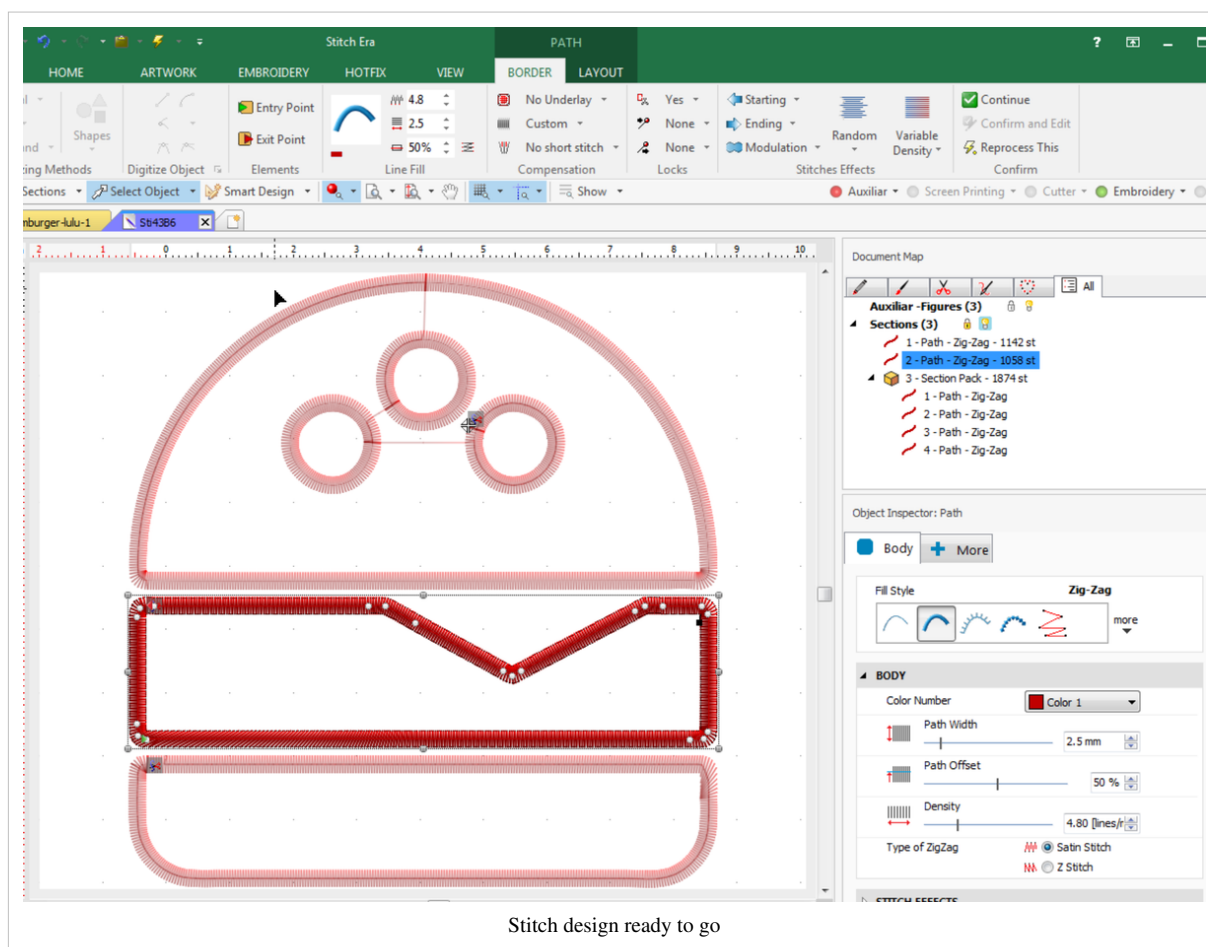
Strangely enough the generated stitches are running stitches. At a thickness of 2, they should be zigzag.

- Open the object manager
- Click on *each* path (including the ones in the sections pack). In the fill style, select zigzag.



You now got an embroidery:

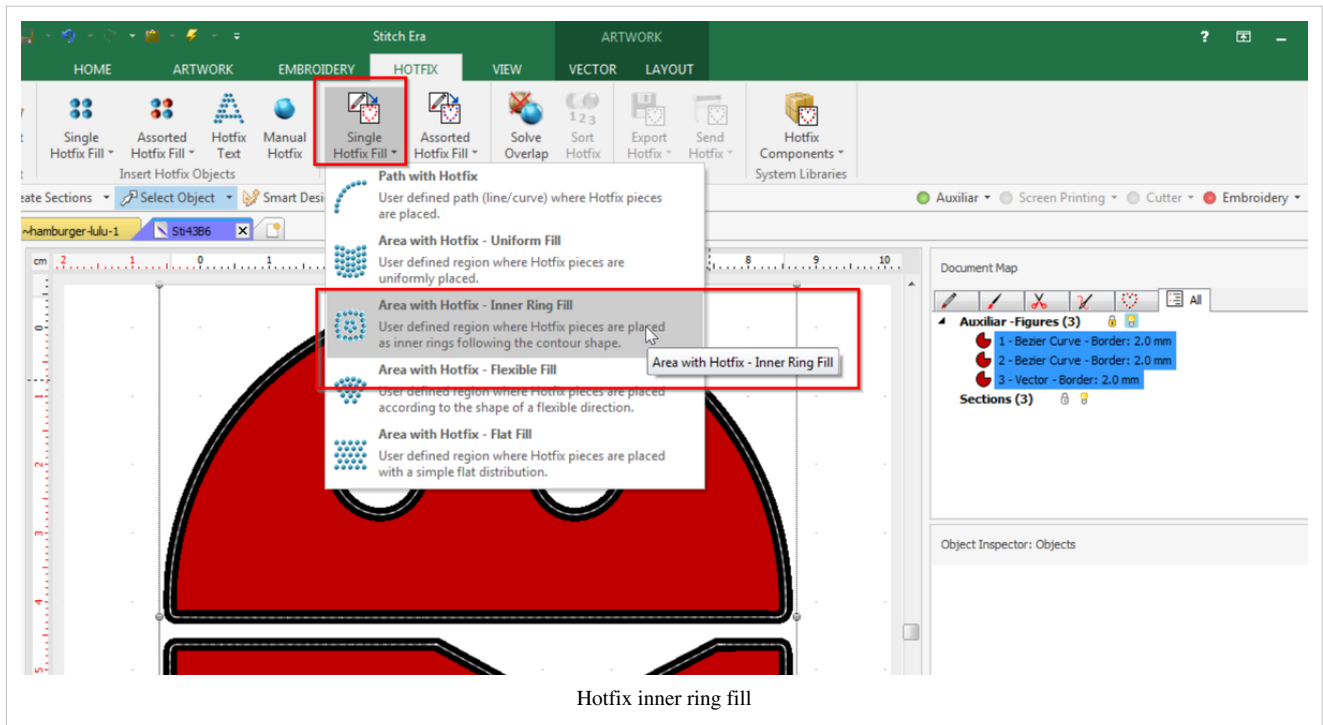
- Hit F9 and then F7 to see the result.



Depending on your taste and textile you now could adjust underlay and density. Otherwise export as embroidery file and give it to your machine.

Transform the fills into hotfix areas

- Hide the embroidery objects (click on the green embroidery button in the main menu bar).
- View the vectors again by clicking on the red Auxiliary buttons.
- Select all: CTRL-A
- Open the hotfix tab
- In the Single Hotfix Fill menu (in the middle of the ribbon bar, not to the left !), select Area with Hotfix - Inner Ring Fill



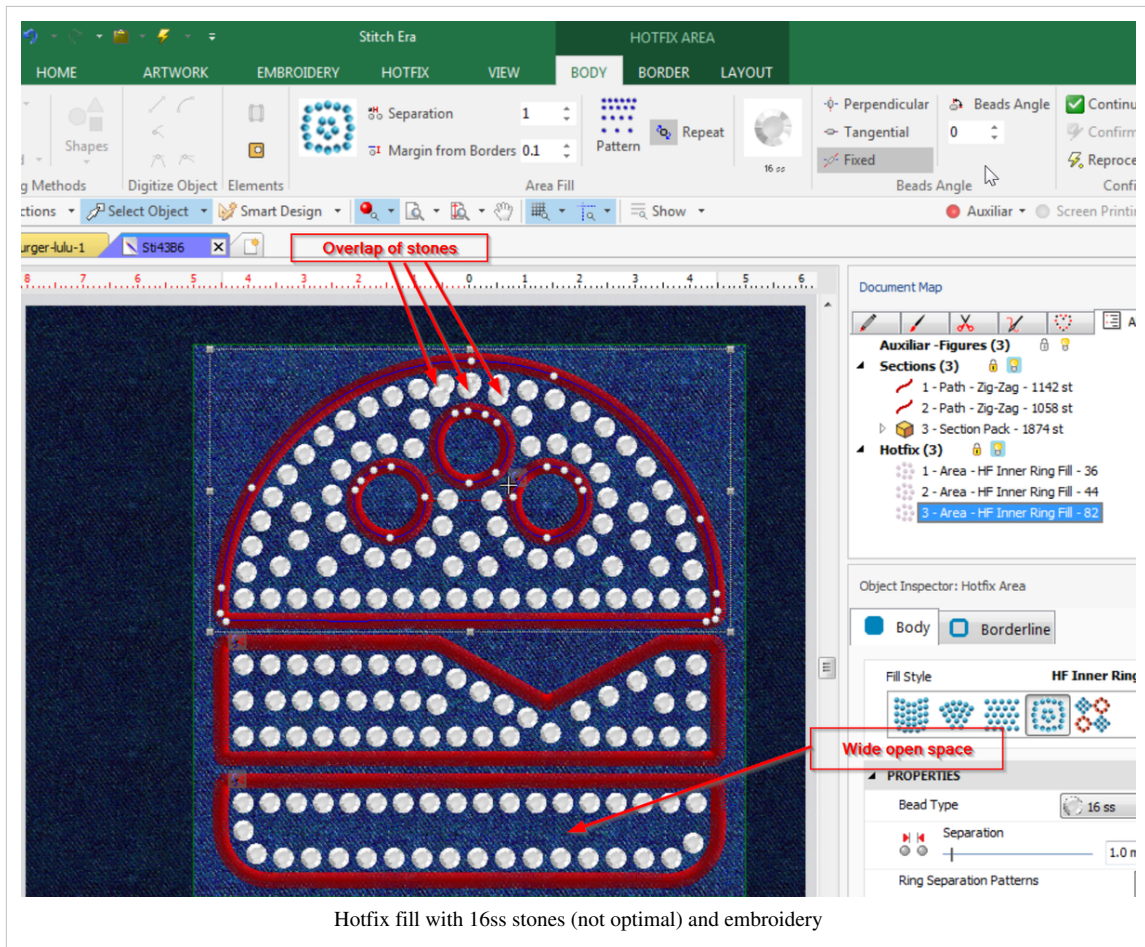
Now

- Untick Auxiliar
- Tick Hotfix (far right in the main menu bar)
- Hit F9 (if you cannot see the hotfix pattern)

The hotfix looks quite good, but it uses 4ss stones, i.e. really tiny ones that are difficult to handle. We prefer working with 16ss (3mm) for now. Select all, then adjust stone size and other settings. I used:

- SS16
- 1mm separation

Hit F9 (or maybe FN-F9 on your machine) if you cannot see the changes. Also, you could add a simulated background using the little "B" menu on top of the palette to the left of the workspace. Show the embroidery again.



Now you should manually fix two things.

- The lower bread has too much empty space. Consider making it a bit fatter without exiting the hoop space of 10x10cm. We moved the two objects on top upwards a bit to make some space.
- On top there is some overlap, either let Stitch Era fix this or (better) do it yourself. E.g. remove the three offending stones.

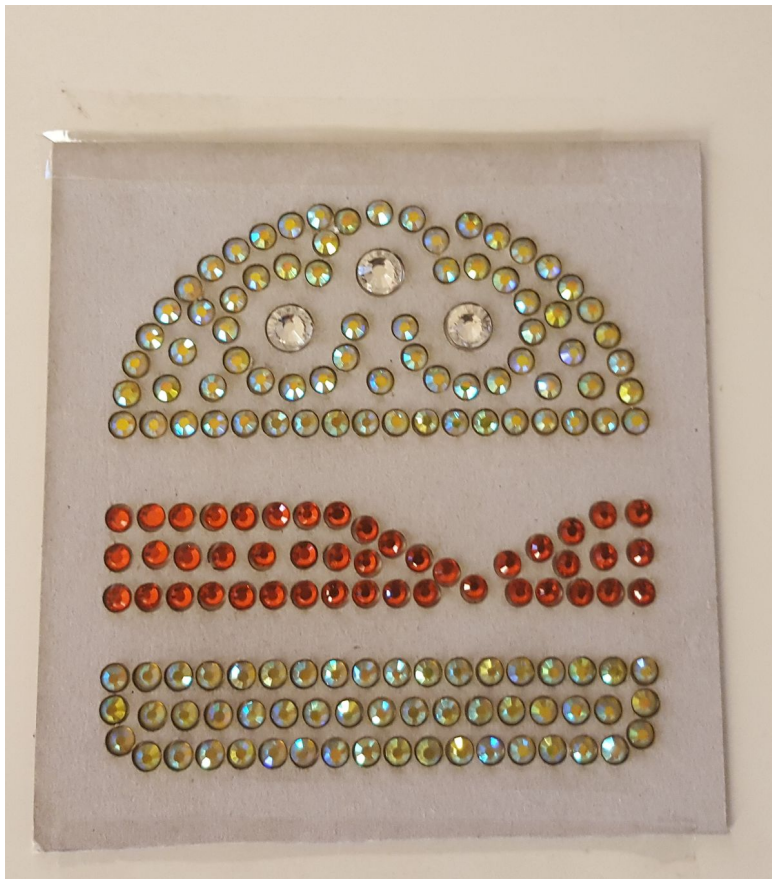
Finally, export the hotfix design to SVG (Hotfix tab -> Export Hotfix -> Export Hotfix to file. Select SVG or whatever is suitable for your cutter.

Heat transfer

After I did the first example described above, I got some good transfer paper from an online store and this time the stones stuck very well.

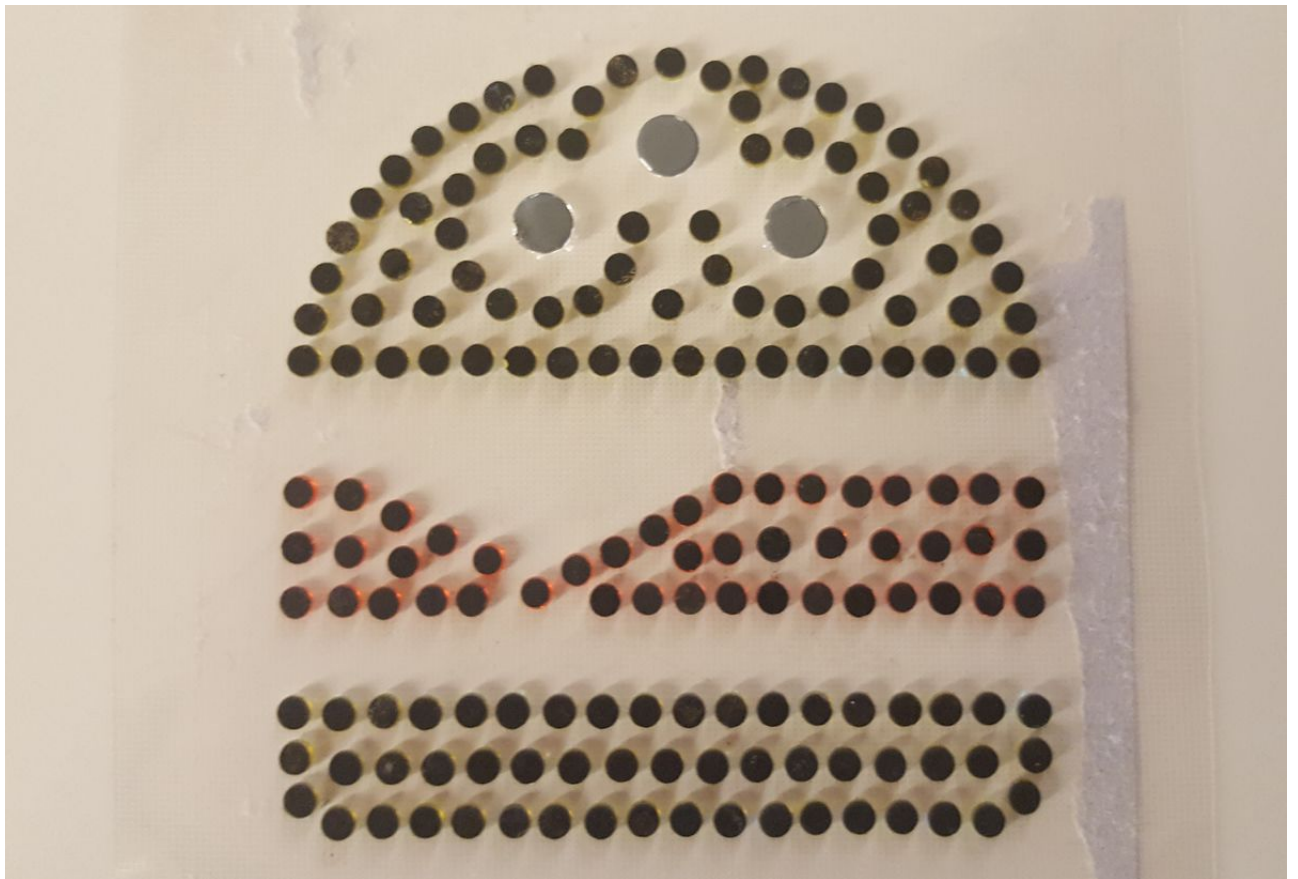


Embroidery first. This tissue probably would need more stabilizing (I used a simple auto-adhesive), or at least larger zigzag stitches



1mm cardboard template filled with 16ss stones, using the "flat mousse brush" technique explained above.

The three large 34SS did not stick after 20 seconds of heating. I then glued them with an applicator
Peeling off the stones from the template went really well. All stones stuck.



Stones sticking to the (turned) transfer sheet



In the heat press, ready to go



The result was satisfactory for my first "larger" hotstone design and my first use of transfer paper. I should improve the embroidery (zigzags pulled too much into the textile) and probably make a larger design. The monogram is also fairly ugly (too small). I then should try smaller stones.

References

- [1] <https://openclipart.org/detail/22539/rocket-icon>
- [2] <https://thenounproject.com/mikicon>
- [3] <https://thenounproject.com/mikicon/collection/burger-world/?i=317585>
- [4] <https://thenounproject.com/>

Article Sources and Contributors

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Heat press *Source:* <http://edutechwiki.unige.ch/mediawiki/index.php?oldid=65675> *Contributors:* Daniel K. Schneider

Ricoo T538B heat press *Source:* <http://edutechwiki.unige.ch/mediawiki/index.php?oldid=65635> *Contributors:* Daniel K. Schneider

Stitch Era - creating hot fix designs *Source:* <http://edutechwiki.unige.ch/mediawiki/index.php?oldid=64788> *Contributors:* Daniel K. Schneider

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