

Dye Sublimation

The process explained



The Magic of Sublimation revealed

At one point in your life you have likely been amazed by a magician revealing a 'randomly' selected card from an unlikely position and they do this with the most amazing precision and consistency. We call it magic, but it really is many years of practise research and skill to create and repeat these amazing feats. While sublimation at first seems like a dark magic, it is really a simple logical process that if you take some basic repeatable steps you will in no time be creating customised masterpieces that will amaze your family and friends.

There are many variables when you look at the Sublimation process. Printer, paper, inks, heat press, blanks and artwork. On top of these parts of the process you also have the actual pressing process which has Heat, Pressure, Time and even weather as factors to consider.

For this article I will assume once you have purchased a printer, press and inks that these won't change in your process until a time when you upgrade any one of these items. At a point you do change these your times will likely need adjusting.

I will focus the bulk of this article on the actual production part of the process apart from three key points on the print process.

First artwork, you can't do a TV Show CSI and create something from nothing in artwork, if the detail isn't there you can't expect the software or printer to work miracles. Use good artwork!! For testing purposes use a good quality image that has blocks of colours, grey gradations and skin tones. Always test using the same artwork to make it constant through your process.

Second is do regular nozzle checks on your printer. It is far easier and cheaper to print a nozzle check prior to printing your artwork than printing it and pressing only to realise the colour is off.

Third is knowing that the transfer when you printed will look nothing like it will when it is pressed. Do not judge the colours until you have pressed it.

Once you have some good transfers ready the next is the actual pressing part which is a combination of Heat, Pressure and Time. If you change any or all of these it will vastly effect results. By making one of those a constant it will make your life a lot simpler and on the path to consistent repeatable results.

Temperature for sublimation is 200°C keep this as your consistent all through sublimation.

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This leaves you with pressure and time. Pressure is the next easiest one. Work on medium to firm pressures with your hard products like mugs, keyrings, photo panels & steins.

With fabric blanks like polyester material, mouse mats, stubby holders and tote bags work on a light pressure to medium pressure.

Mouse mats and Stubby Holders will need almost no pressure at all. As you apply pressure with the press these materials compress and squish out becoming larger surface if you use too much pressure, You will then sublimate at that size and then at the end of the press time you release the press, the blank will spring back to it's non compressed state (smaller) and the transfer paper stays at the same size throughout, it will continues to sublimate as you release the press and you will end up with ghosting. A very light pressure to eliminate the squish gets around this issue on these thicker squishy products.

Press time is the last one in the equation. This is dependent on the product and your individual setup. Any press time that you get from various sites are to be treated as a starting point. Extensive controlled testing of each item is necessary to get you on the road to consistency.

Fabrics as a guideline are 45-60 secs, and these products tend to be pretty forgiving. The two things that will trip you up on fabrics are; ghosting as mentioned earlier and then second is moisture. Fabrics can act like a sponge and soak up moisture in the air. As soon as you press the moisture will turn to steam and you will end up with faded or sometimes blank sections on your products. To get rid of the moisture a pre-press is recommend before putting your transfer on to press. When you pre-press you may see steam coming off the garment, this is the moisture we are trying to get rid of. Press long enough to get rid of the moisture usually only around 5 secs.

Hard Blanks will be anywhere from 45 secs to 5 mins! Things like the metal keyrings, dogtags sit on the quicker side at 45-60 secs. Mugs, money boxes and steins sit around 3.5 mins and your thicker glass awards are around the 5min mark. As mentioned earlier these are rough guidelines to start from.

Once you have printed your transfer and got it taped ready to press then record what you are doing. Blanks type, Temp (200°C), Time x secs and pressure light medium or firm. Don't trust your memory, write it down!

Your item is coming off the press hot, so be careful handling it. One key point to note at this point it will continue to sublimate until the blank has cooled down. If you leave the transfer on it will continue to transfer. If you take the transfer off and it falls back on the blank it might ghost. If you take the transfer off and leave it sitting any remaining gasses will rise up and cause 'bleeding' of the image above your design. At this point some people suggest dunking in warm water to stop the process. I used to

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be in this camp but found my mugs developed cracks inside the mugs and they also faded quicker. Which makes sense if you dunk a mug from 200°C in cold water it will shatter, warm water doesn't visibly crack it but on a micro level it does. Warm water would be at maybe 40°C which is significantly cooler than the 200°C it comes off the press at. My preference is to place the mug in front of a pedestal fan, this blows the gas away and cools slower than dunking. Since using this method my mugs are crack free internally after many washes.

Once you have your printed blank if the result is not what you are expecting you will need to establish whether you need more or less time. The finished product is telling you all the info you need.

Is the colour patchy, white or are there lighter colours where it should be solid? This is an indication of not enough time, Add 30 secs and try again. Potentially it could also be not enough pressure but change one only not both. Remember a medium to firm pressure on the hard substrates and light to medium on fabrics.

Are your blacks brown? You have left it too long in the press. Drop it by 30 secs and try again.

Are your blacks spot on, but you are getting some bleed around the edges where it looks fuzzy not sharp. You have left it too long and it is starting to leech outside the print design. but not long enough to brown the blacks. Drop the time back 15-30 secs and try again.

Also note with mugs in particular the base is a lot thicker and will take longer to sublimate near the base. If you look at a printed mug near the base and it is faded good chance it needs a little more time to fill in the faded areas, potentially though you may over cook the top of the mug. To get around this you can give the base of the mug a pre-press before taping your transfer sheet on. This will get some heat into it, only needs a few seconds. This is more of an issue during the colder months.

Be prepared to chew through some blanks when you start out while doing your testing. It will be well worth the effort as you will quickly identify issues down the track. Sometimes you will see a change in the results using the same settings and products but what you didn't know is the supplier changed where they get their blanks and what was working now needs a tweak on your settings. Using what you learnt above you will know straight away what is needed and quickly adjust.

It is possible to run test strips and use a blank several times to do multiple tests. If you choose to do this there are a couple of things to be aware of. Firstly, any previous sublimated section will be activated again and dye anything it is touching, so make sure any previous designs are covered to prevent damage to your press. It will fade the first print which means you can no longer reference it for results as it will be different to how you first pressed it. Lastly make sure if you press it again that the

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temperature is back to where you normally start from. If you press a hot blank your times will be different.

In no time at all you will be producing excellent results time after time. The initial hurdles to get your specific times setup can be frustrating but well worth the efforts to learn your setup and how to read results. After you have done this with a couple of different blanks the subsequent items then become a lot quicker to get times dialled in. If you think about your blank and relate it to similar other blanks you have already tested, you will have a great starting point.

Happy subbing!



Trouble Shooting Example

The image to the left shows what happens if you put your transfer too close to the handle of your mug. The mug press has less pressure near the edge so it gives this faded edge instead of a crisp line.

You will also notice the bottom of the image is a little faded under the text. This is what happens with the colder base.

The text is the interesting one that is often misinterpreted as too long as it is brown. In this case it is brown and sharp so indicates not enough time. Which backs up the colour fading around it too from the colder base.

The text below is when it is too long, it becomes brown and blurry.

