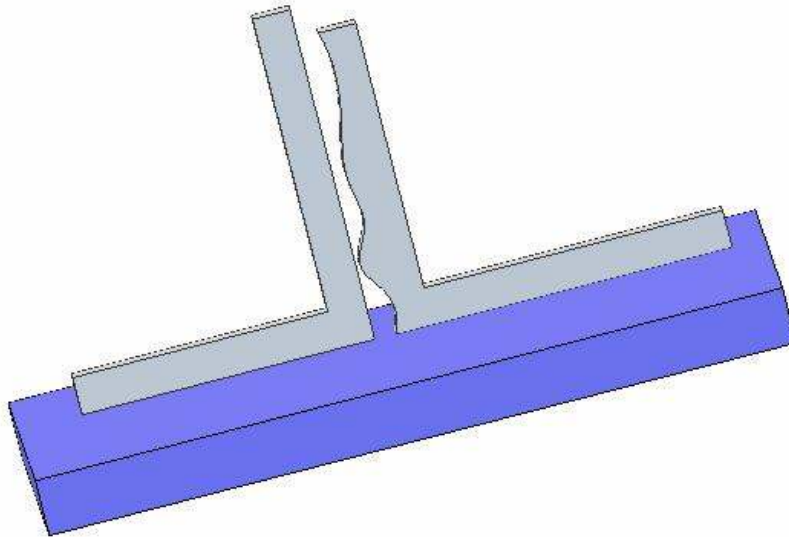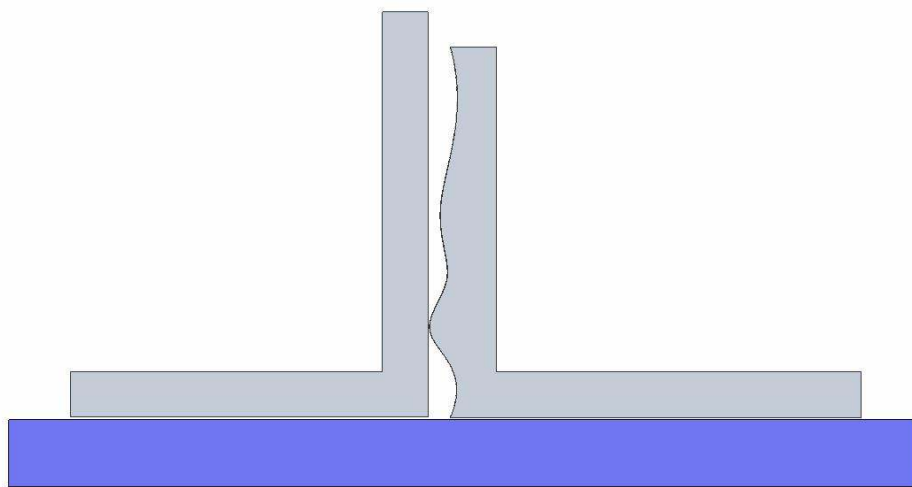# Truing Up a Square with a Known True Square

By R. G. Sparber

If you have a surface plate and known true square, it is surprising easy to true up a low cost square that is not true. By low cost, I mean that the metal can be draw filed[1]. If it is hardened, you are out of luck. I'll call the out of square instrument my target square.


Here is a side view with the target square's edge greatly exaggerated.

There is a product called Dykem® Hi-Spot Blue. It is

[1] A lot has been documented on draw filing, for example: http://www.youtube.com/watch?v=Dec78RQsokw

smeared on the reference square to a thin coat. Then the two squares are firmly pressed face to face on the surface plate. As the name implies, the high spot on the square to be trued picks up the dye.
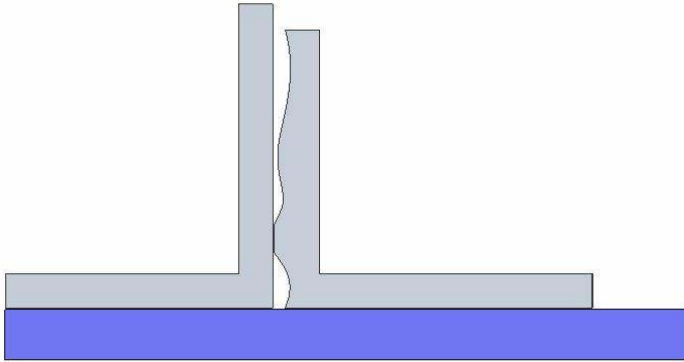
You then draw file that area a few strokes and repeat the process. With experience you will know how much draw filing to do.
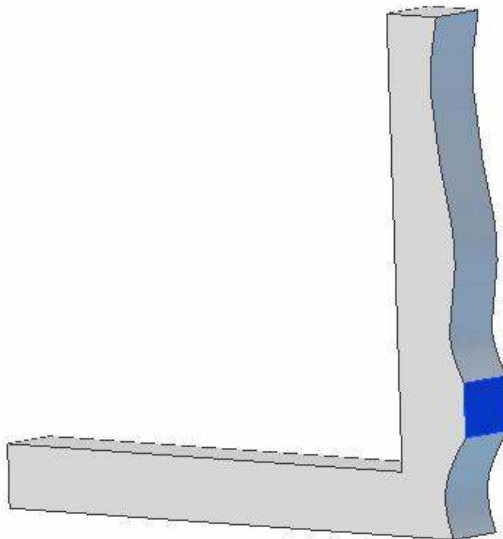
You can see here that I took off some of the bump but not enough that the next bump will contact our reference square.
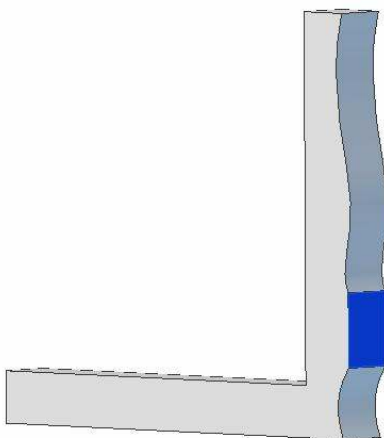
So this time the dye will cover a larger area.

The blued area is draw filed again.

Its back to the surface plate with a fresh coat of dye on the reference square. This time we get an even larger area. Since it is all in one area, we know that we have not hit the next highest bump yet.
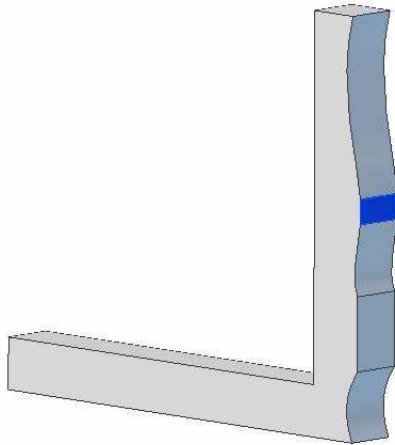
After draw filing and printing with the reference square and dye, we see a new area blued. This means that the bump we have been reducing is now lower than this newly discovered bump.

The process continues until our target square is arbitrarily close to our reference square. When the entire face of our target square is printed with dye from our reference square, the two are congruent. Assuming the reference square is perfectly true with a perfectly flat vertical surface, then so is our square.

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