**The Relationship Between Pad-Print and Printing**

**Pad-print is one of the gravure. Covering the ink on the steel plate and scraping the ink on the platform. This will leave the ink inside the notch. Using the rubber pad to stick the ink and then print it on the printed object. The objects can be all kinds of different materials. For example, plastic case, metal, high-tech related products and etc. Compare to screen-print, it is more suitable to use pad-print for small patterns, thin lines and uneven surface objects.**

**Jigs (Aids)**

1. **If the printing object is very thin and light, the platform with suction function is recommended. Espically for those with large printing pattern. When the pattern is big and the printed object is thin and light, the ink will stick the object toghther with the screen. The suction function is also used for the convenience of the fixed position.**
2. **Superstrength healant is commonly used to make the aids because it is done fast and convenient. Other materials like mealamine resin and epoxy can also be used.**
3. **No matter what kind of the printing metheds used, it is very important to keep the objects horizontal. However, the screen printing method is the most severe.**
4. **If the printed pattern is very close to the edge of the object, it is the best to add a pedestal to avoid center point of the pad hanging in the air. This may cause the deformation of the pattern.**
5. **If the printed object is soft, it is better to place a padding block underneath the printed object.**

**Steel Plate**

1. **Depth of the pattern on plate is from 5u to 45u.** **To print absorbent material such as cloth, paper and ceramic, it is better to use deeper steel plate. For 4-color screen dot manuscript, the depth is about 15u-20u. For general plastic and metal (thinner pattern), the depth is about 20u-25u. For thicker line pattern, the depth is about 28-35u. The deeper the depth, the higher density (Fast-Dry) ink is needed.**
2. **Most of the people is using “Steel Plate” in the market. There are also aluminum plate, resin plate and stainless steel plate used.**
3. **Surface of the steel plate – Normally, both plane grinding and emery grinding are aapplied. Sometimes, people only do the plane grinding to save the cost.**

**Size of the steel plate – Based on the machines and printed pattern sizes.**

**New 60mm ink-cup pad-printer uses**

**200 mm L. x 90mm W. x 10mm thick steel plate.**

**Old 60mm ink-cup pad-printer uses**

**180 mm L. x 90mm W. x 10mm thick steel plate.**

**90mm ink-cup pad-printer uses**

**240mm L. x 120mm W. x 10mm thick steel plate**

**Attentions for Ink-cup style steel plate**

1. **The direction of the manuscript and jig(aid) has to be the same**
2. **The steel plate has to be “Emery Grinded”.**

**Commonly used plate sizes are: 80\*80mm; 80\*95mm, 100\*100mm, 110\*140mm, 100\*150mm**

**Attentions for ink-plate style steel plate:**

1. **Left and right side of the steel plate have to be 15mm more than the printed pattern. Front and back side of the steel plate have to be 20mm more than the printed pattern. It is more convenient to use.**
2. **If there is long line pattern, make sure that the pattern is not paralleled the scraping device to avoid falling into the gap.**

**Ink-Cup**

**There are 3 sizes of the ink-cup: 60mm D, 90mm D, 130mm D**

**When designing the pattern, make sure that the size is 5mm less than the ink-cup’s daimeter.**

**Ink**

1. **If distinguishing ink by drying methods, there are 3 kinds - Solvent Evaporation, UV Dry and Water-Based inks.**
2. **Solvent Evaporation Ink– The drying speed depends on ignition point of the solvent. The higher the ignition point, the slower the evaporation of the solvent. For the faster evaporation speed, it is better to use on pad-print. When printing, the ink has to be half way dry to be able to deinking.**
3. **UV Drying Ink – The drying of the ink is depending on the UV light. Although there is UV ink specially made for pad-print these years, the outcome is still no better than using the solvent-evaporation ink.**
4. **Water-Based Ink – It is evaporated and dried naturally. You can speed it up by using the oven. This kind of ink used on pad-print is normally for special industries like ceramic and contact lenses.**
5. **There are many different materials of the printed objects; Each object has its own adherence condition; therefore, there are many different brands of the ink and each brand has many different series in order to meet the printing requirements.**

**Rubber Pads**

1. **The thinner the pattern is, the sharper/harder rubber pad is used.**
2. **The closer the ink is to the center of the pad, the better the exhaustion is.**
3. **When the new pad has poor ink absorption, you may use alcohol to clean the pad surface.**
4. **The deinking effect is the best when the pad ink is at semi-dry state. The deinking process can be done successfully more than 10,000 times per day.**

**Operation Steps (Ink-Cup Style)**

1. **Prepare all the materials: 1. Steel Plate 2. Rubber Pad 3. Ink 4. Solvent 5. Jigs 6. Printed Object**
2. **Pour the ink into the ink-cup and add the thinner (about 20%).
For RUCO ink/Thin Line/Steel Plate Depth 20u-22u - Use standard or fast evaporating solvent.
For MARUBU or WK Ink/Thin Line/Steel Plate Depth 20u-22u - Use fast evaporating solvent or extra-fast evaporating solvent.
For RUCO Ink/Steel Plate Depth 25u-28u - Use fast evaporating solvent or extra-fast evaporating solvent.
For MARUBU or WK Ink/Steel Plate Depth 25u-28u - Use extra-fast evaporating solvent.
For MARUBU or WK ink/steel plate depth 25u-28u, if using extra-evaporating solvent and still cannot deink completely, use the dryer on ink before printing. If this is still working, try placing the ink for sometime to evaporate the slow-dry ingredient inside the ink and then add the extra-fast evaporating solvent.**
3. **Turn on the Machine power and open the Pneumatic Valve.**
4. **Place the ink-cup into its cover and connect it with the steel plate. The ink-cup has to be parallel with the steel plate and then push it in slowly.**
5. **Lock and fix the the ink-cup set on the steel plate.**
6. **Push the ink-cup cover forward until the semicircular area connected to the bar on ink-cup-shelf.**
7. **Press D/BLADE buttom, push the shelf and shake it to make sure that bar is connected tightly with the ink-cup set.**
8. **Lock the rubber pad on the pad-plate. There are 6 sizes of the pad-plates: 13mmH./23mmH./33mmH./43mmH./53mmH./63,,H.**

**Using different height plates for different sizes of the rubber pads.**

1. **Lock the rubber pad on the stand and adjust it’s position.**
2. **Adjust the sensor (S4) located above the steel plate to the highest point. Use “Pad-Test” function to adjust the compressing height.**
3. **Press AUTO buttom to move it out front and then press AUTO one more time to make it stop.**
4. **Fixed the jig on T-Slot and lock it tight. Place the printed object on it.**
5. **Adjust the sensor (S7) located above the printed object to the highest point. Use “Pad-Test” function to adjust the compressing height.**
6. **Press “Manual” buttom and try printing a couple times. If everything is ok, the production can be started.**

**Solutions to Printing Defects**

**Q1: Incomplete printed pattern**

**A:**

1. **Check the pattern on the steel plate to see if it is complete**
2. **Check the ink to see if it is too thick. If yes, the small/thin pattern may not be printed out.**
3. **Check the ink to see if it is dried too fast. If yes, the small/thin pattern may not be printed out.
Set the time before sticking the ink to 0
When the pad compression speed is too slow, it will cause the ink become dry. Thus, the pad is unable to suck the ink up.**
4. **Bad ink absorption for the pad. When this happens, not all the pattern can be printed out. Some area will be missing.**

**Q2: The printed pattern is complete but the ink-drawing will occur.(no direction)**

**A:**

1. **Use adhesive tape to clean the pad and try to print again. If the ink-drawing still happens, it is very likely that the ink is too sticky.**
2. **Adding thinner under the circumstances of no overflow ink.**
3. **Adding ST1 extender base to reduce the ink viscosity**
4. **Reducing the speed of lifting the rubber pad.**

**Q3: Ink-Drawing (Along the direction of scraping ink)**

**A:**

1. **Ink scrapped is not clean – Adjust the scraping ink pressure on the right side.**
2. **Take off the ink-cup and check the cup blade by nail to see if it is damaged.**
3. **Scraping ink on the steel plate for more than 150K – 200K times will result in unclean situation.**

**Q4: Overflow Ink**

**A:**

1. **Ink is too thin**
2. **Rubber pad is too hard**
3. **Scraping ink on the steel plate for more than 150K – 200K times will result in unclean situation.**

**Q5: Bad Exhaustion (Pinholes on the end of the printed line)**

**A:**

1. **Using sharper/harder rubber pad**
2. **Reduce the speed of pad compression**
3. **Print on adhesive tapes 20~30 times before printing on your object.**