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ArkePro
OFFICE 3D PRINTER

FULL COLOR

ECO-FRIENDLY

PROFESSIONAL

10 Steps to Success

22st Feb 2019 – support@mcortechnologies.com - http://service.mcortechnologies.com/files/ArkePro/

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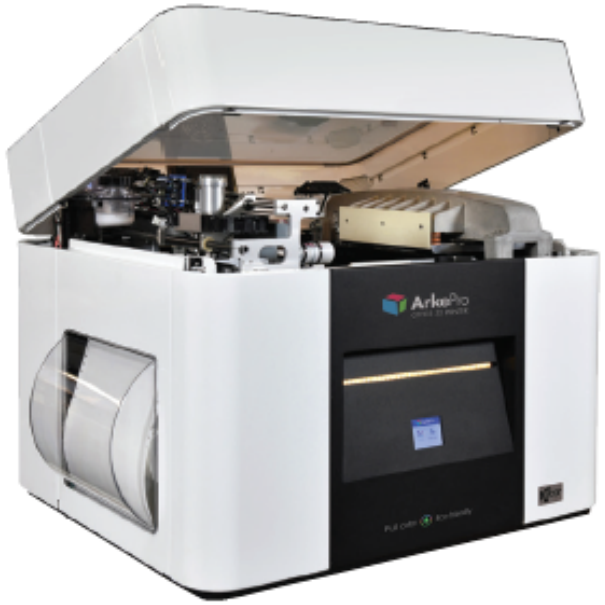


Bring Your Designs to Life

ARKePro is a full color 3D printer enabling professionals to produce highly stable tactile models and prototypes. This office ready 3D printer uniquely uses inkjet with specialized paper and adhesive (using patented SDL Technology) to build robust, textured, heat resistant, durable and effective parts for use across a wide variety of industry sectors and applications.

The ARKePro 3D printer is office ready, safe, clean, eco-friendly, and professional grade, enabling creativity and innovation in ways never before possible.

Introduction

- ArkePro has been in production for 3 months now, and feedback is positive.
- Variation in success level can depend on prior experience using SDL Technology.
- Training, communication, and detailed instruction at install can significantly influence the initial experience, perception, and level of success.
- There are key factors that can affect initial success are:
  - User Related
  - SDL Technology Related
  - Product Related
- In this presentation we want to discuss 10 key steps that can bring you to maximum success
- The latest versions of manuals, software, videos, best practice documents, and build files can be downloaded from: http://service.mcortechnologies.com/files/ArkePro/

10 Steps to Success

A. User Related
   1. Blade depth
   2. Glue wheel and heat plate cleaning, and preventative maintenance
   3. Re-positioning of gantry after cleaning & maintenance
   4. Build mat

B. SDL Technology Related
   5. 3D Design not optimized for SDL
   6. Amount of color on bottom layer of part
   7. Humidity & temperature

C. Product Related
   8. Knife to Image alignment
   9. LCD
   10. Firmware & Features

1: Blade Depth

- Blade too deep can result in:
  - Axis error on layer 1 due to blade slightly digging into the mat
  - White stripes or color peels away from part during weeding
- Blade not deep enough can result in:
  - Difficult part weeding
  - Failed build due to paper roll not releasing from part (Paper Tear)

- **MOST PEOPLE ARE SETTING THE BLADE TOO DEEP**
- **Setting takes practice, but the blade should cut through the first layer and only score through 10-30% of the 2nd layer.**
- **Tip: Paper is 0.1mm thick so the blade should protrude approx. 0.110-0.13**

- **Please refer to manual & instructional video on http://service.mcortechnologies.com/files/ArkePro/**

2: Glue wheel & heat plate cleaning

- **Always thoroughly clean glue wheel** after using machine and prior to starting a new build
- On large builds, pause the machine every 12 hours and clean the glue wheel
- If you see anything stuck to the glue wheel, then clean it.
- If you see any pieces of hard glue on build plate, pause the machine and remove them.

Cleaning steps:

- Use the tool provided 1st to remove hard pieces
- Then clean with wet sponge, rotating the wheel
- Finally you can use a toothbrush clearing the dimples
- **Never use metal instruments to clean glue wheel**

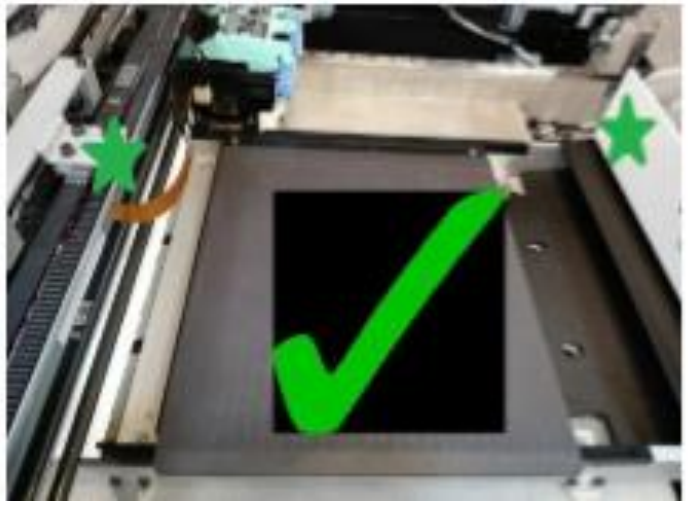
Glue wheel should **always be this clean**

Preventative Maintenance

This should be done in accordance with user manual **during install** and on a regular basis.

3: After cleaning & maintenance

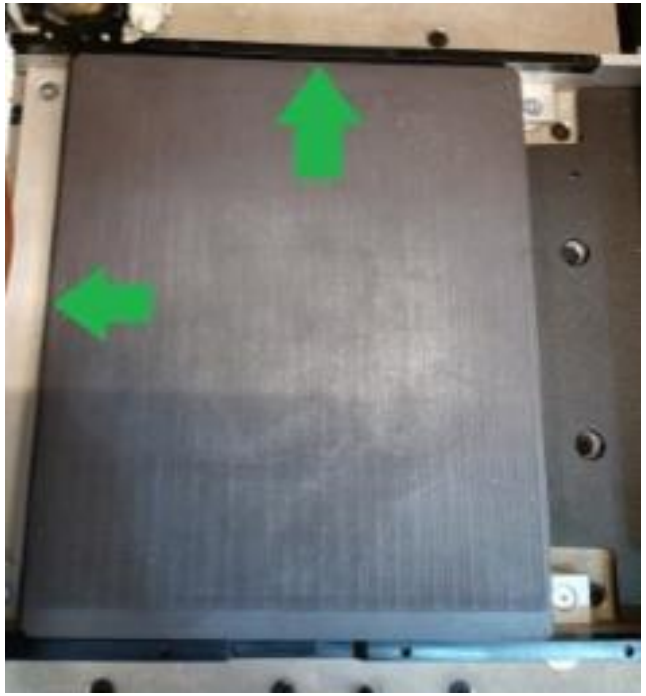
- After cleaning or maintenance, be sure to reposition axis in the correct place
  - Move heat plate fully to the right.
  - Move carriage to the left.
  - Then close the lid
- Failure to do this can result in axis collision and an axis error.



4: Build Mat

- Beware: ArkePro has a different mat to Arke – Ensure you use the correct mat
- Position mat so that top left edges touch the raised guides.
- The Mat **must not**: sit on top of raised guides
- The Mat **must not**: protrude from the build plate on bottom right edges.
- Ensure the left top raised guides are clean and that mat sits perfectly flat.
- Ensure mat is perfectly cleaned with water, sponge, and dried prior to a build.
- Ensure mat is correct way up. It's not reversable. Shiny surface down.

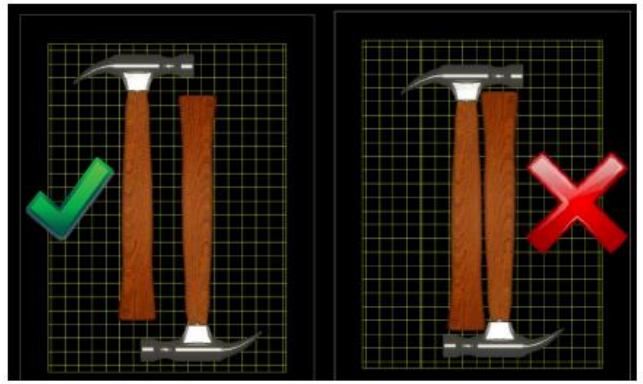
- **Incorrect installation can result in:**
  - Damaged mat
  - Axis error
  - Poor or no gluing
  - Poor cutting
  - Ink cartridges to touch paper
  - Failed build



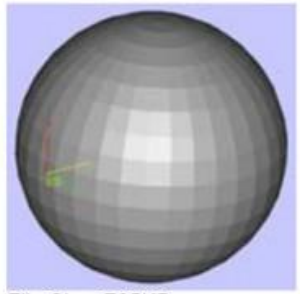
Correct alignment of mat against guide rails

5: 3D Design not optimized for SDL Technology

- Design rules apply to all forms of 3D printing – Including SDL technology in the ArkePro
- Our design guides for SDL are: “3D Design Rules” & “Guide to Building Parts”
  - Available from support@mcortechnologies.com
- General Rules:
  - Part placement – In the center – 10mm minimum spacing.
  - Do not stack parts on top of each other.
  - Avoid solid color on bottom of large flat parts.
  - Avoid small gaps between features, creating small slithers of waste.
    - Assemblies generally have small gaps
  - Wall thickness – 2mm in the x-y plane and 0.3mm in the z plane
    - 2mm thickness in x-y is only ok for smaller features.
      Increase to 3mm for large features like high flat walls.
    - 0.3mm in Z will be flexible and can be used to create a live hinge.
  - Manifold polygon part – No inverted triangles or intersecting bodies.
  - With all 3D printers, file quality is important. **Bad file in=bad file out.**
    Pay attention to correct settings when exporting from CAD programs.



Multiple parts must have 10mm between them
(each grid square is ~10mm)



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Coarse Faceting (Poor)

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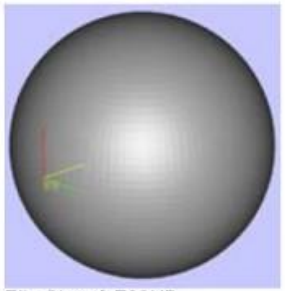
Excessively Fine Faceting (Fair)



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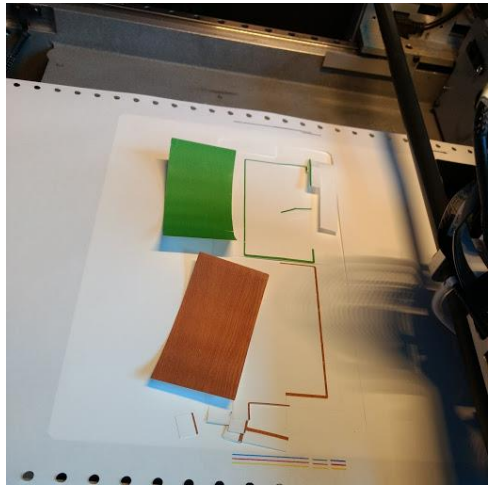
Good Quality Faceting (Good)

6: Amount of Ink on Bottom Layer

- When the bottom layer has a large flat solid ink base it can affect the paper gluing together
- This can result in delamination of the 1st model layer, paper curling, and ultimately build failure
- Example:



Note:
Some older demo files from Mcor may have color on the bottom surface.
ie – “Arthur's Seat” GIS Map has 2 versions, One with a green bottom for legacy machines, and one with a white bottom for ARKePro.

- Solution: Angle the part in the build area, or paint the bottom white using Orange Peel Software
- DO NOT INCREASE GLUE PRESSURE TO TRY AND RESOLVE.
- Mcor are looking at potential solutions to improve this, which may release in future firmware

7: Humidity & Temperature

- It is possible that glue pressure needs to be calibrated due to temperature or humidity change
  - The glue pressure is set in the factory, but it can be adjusted at installation or by users in Orange software
- Outside environment is not necessarily relevant.
  - In cold weather, a dry environment may occur because central heating is used inside the building
  - **Buy a humidity and temperature reader to monitor the machine's location.**
  - **Optimum is 40-50% humidity / 20-22°C**
- Too low glue pressure will result in delamination of layers
- Too high glue pressure will result in difficult or impossible weeding, or worse case glue leak
- Before adjusting pressure, please be aware:
  - After reducing pressure the glue cap must be unscrewed and replaced to release existing higher pressure.
  - Normally glue pressure does not need adjusting unless models are delaminating, or weeding is difficult.
  - If paper is not sticking together during build, this is probably a glue blockage, too much ink on layer, or the glue wheel is not touching the build. Adjusting the glue pressure here will have no effect.
- **ALWAYS TAKE NOTE OF THE ORIGINAL GLUE PRESSURE BEFORE CHANGING IT.**
- Always consult with support@mcortecnologies.com before adjusting the glue pressure.

8: Knife to image alignment

- When the knife to image alignment is poor, the models may have color missing.
- Out of alignment  VS  Correct alignment
- Sometimes the alignment can change if the machine is moved, Environment changes, or when a machine is incorrectly powered off. This can also be caused by the maintenance station not being seated correctly (which affects self-alignment of the print carriage).
- Be sure that the maintenance station is properly clicked down into position.
- Run a knife to image alignment prior to the first few builds to check it's not moving.
- During Install, set the alignment, switch the machine off & on again, recheck the alignment to ensure it hasn't moved. The alignment numbers should match the ones printed before

9: LCD Screen

- Reports of unresponsive LCDs
  - **Please use the stylus provided.**
    - Only press once per selection, and wait a few seconds.
  - **Being patient is extremely important when interacting with the LCD.**
  - **Please wait a few seconds** after pressing a button for machine to process.
    -**Do not** continuously tap it.
    -Starting a build for the first time, or loading from the memory/USB can take up to ~10 seconds.
    - **The Machine can skip steps** if screen pressed more than once
  - The clear screen cover is a CE safety requirement, do not remove it. It protects the machine from static.

    -The bubble texture when the LCD is turned off is normal.

- Note:
  - Please be patient with the LCD and understand the any delayed response to taps is not due to the LCD, but the complex mix of electronics, hardware and processing.

10. Firmware & Features - Update Log

- Cloud, App, Wifi Services – Have been deprecated. They may be removed or reactivated in the coming months
- "Automatic Waste Removal" – **This experimental feature has been deprecated** due to technical challenges that significantly limit the geometries that can be printed, causing print failure.
- **On firmware versions below 4.2-0:** Every 12 hours the ARKePro is idle it may attempt to run a test maintenance procedure. This can freeze the machine, requiring a reboot. **In the latest firmware 4.2-0 this is resolved.**
  (Only update with the guidance of support@mcortecnologies.com)
- Due for release in the next 4-8 weeks as a firmware upgrade:
  - Print from non-zero layer feature – This will be to allow users to recover a build after an error.
  - Selecting a mono or color build option.
  - Correct handling of the knife life and warnings when knife needs to be changed.
  - Visual updates to the startup logo
- Firmware upgrade failures – Please do not update the firmware without consulting support@mcortecnologies.com as you may end up with corrupted firmware. Some machines need a new circuit board before firmware can be upgraded. **We are currently rolling out this hardware update** and you will be contacted by support in the coming weeks to advise if you need a new board or not.
- **Do not switch off machine during firmware update**. Be patient and contact support if any issue – failure to follow procedure can damage the machine**. Please wait for the update to completely finish.**
- Stop button – This cancels the build, but only works after layer 0, and you must wait for the machine to finish the layer it is working on, so it won't stop immediately. In the case that you wish to stop the machine immediately, simply open the machine lid.
- We also intend in cleaning up of some dialogs when the system is paused that tell user to tear paper when this step is not required

Summary

We hope this has been useful, and please let us know if you see any other issues that we have not covered.

We do plan to follow this up with a video to better explain the 10 steps, but we felt is was important to share this information as soon as possible.

Please bear with us as we roll out firmware upgrades over the coming months to activate more features

This information can be shared with all ArkePro customers if req'd

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