AMT PostPro SFX Training Presentation



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Disclaimer

Please note that this presentation may not cover every specific detail or scenario regarding the safe use and operation of the PostPro SFX. The information provided is an overview for training purposes only, and we do not guarantee its completeness or accuracy.

For the most detailed and up-to-date information, please refer to:

- **Knowledge Base**: In-depth articles and troubleshooting tips.
- **User Manual**: Comprehensive operational instructions.
- **Site Preparation Document**: Guidelines for site readiness.

We advise consulting these resources regularly to ensure you have the latest information. By proceeding, you acknowledge your responsibility to refer to these documents for precise details.

1. Safety

Safety

PPE:

- Nitrile gloves.
- Heat-resistant gloves, for temperatures up to 170 Degrees Celsius.
- Close-fitting Safety glasses/goggles.
- Respirator with A2 organic vapor filter cartridges.
- Laboratory spill resistant coat



Facility Safety Recommendations:

- Eye wash station.
- Spill clean-up kit, suitable for use with PostPro Pure.

Site Preparation:

- **Level:** The floor/surface where the SFX is situated must be level.
- **Weight:** The floor/surface must be capable of holding the SFX.
- **Electrical Connections:** Must be in line with local legislation.
- **Ventilation:** Sufficient ventilation is required in the room.
- **Temperature:** Needs to be stable away from heating/AC units.



Safety

Machine Safety Features:

- **Forced Drying Cycle:** Whenever the process is interrupted and unable to finish, the machine will automatically start a process called "Forced Drying Cycle". This cycle is designed to remove any traces of solvent from the chamber so that it can be opened safely. There is no way to skip this cycle.
- **Internal Safety Checks:** Automatically before and during a process, the PostPro SFX will ensure that it is running correctly and immediately stop if anything is found that may impact the user's safety.
- **Recovery Bottle Detection:** A sensor is in place to prevent the machine from running without a recovery bottle in place. Therefore, a fresh bottle must be loaded every time the machine is topped up with consumable.



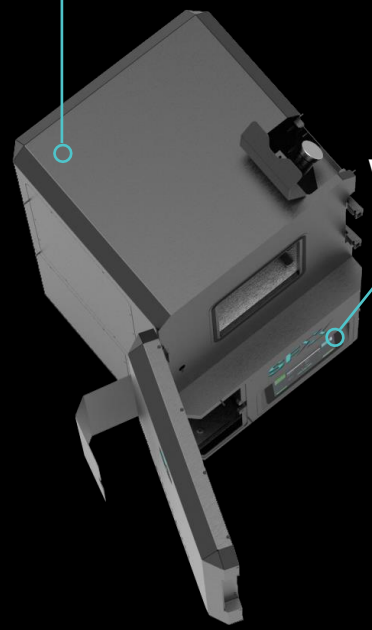
2. Machine Overview

Machine Overview









Machine Overview



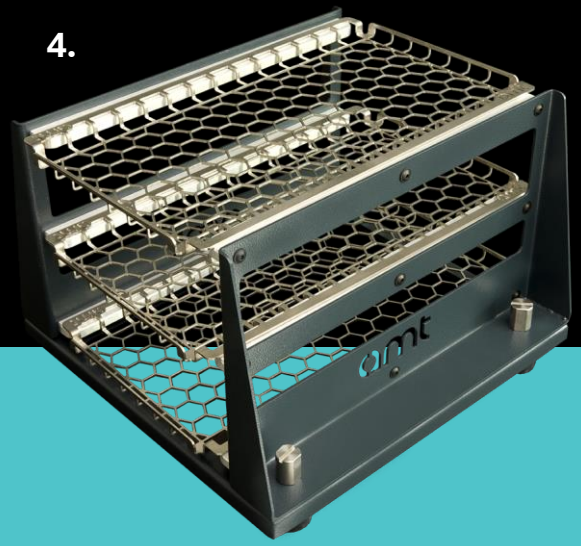
3.



1.

2.

4.



5.



1. PostPro SFX Machine Stand
2. PostPro SFX Processing Rack
3. PostPro Pure Bottle(s)
4. PostPro SFX Rack Storage Stand
5. PostPro SFX Rack Preparation Stand

3. Using the Machine

User Screens



1. **Processing:** This will load the FLEX Recipe menu to allow processes to be started.
2. **Settings:** This takes you to the settings menu for changing consumables and network connectivity.
3. **Home:** This takes you back to this home screen.
4. **Errors:** Lists all the errors which the machine currently has.
5. **Network:** Informs you whether the machine is connected to the internet or not
6. **Power Button:** Used to power down the machine.

User Screens



1. **FLEX Recipe:** Select the relevant material for the parts that are going to be processed.
2. **Avg. Wall Thickness:** The average wall thickness of the parts that are being processed.
3. **Intensity:** How smooth you want the parts, the larger the number the more aggressive.
4. **Chamber Fill:** Defined depending on how full of parts the chamber is.
5. **Start Processing:** Turns “Blue” and allows a process to be started when ready.

4. Pre-Processing Tips

Pre-Processing Tips

Ensure a good printing quality is achieved.

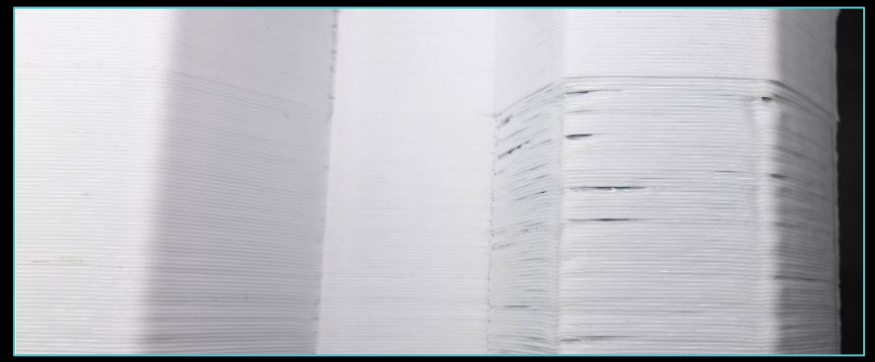
Many factors can affect the printing quality, this includes:

- Design and geometry of the part
- Orientation within the build
- Printing technology used
- Material
- Printing parameters

For example, parts may have large layer lines due to poor layer adhesion using FDM technology or have suffered from thermal bleeding during the MJF printing process. Each of these impact the results of the smoothing process so these issues must be eliminated first.

Please note that if the printing quality is poor, the post-processed surface quality will be affected.







Pre-Processing Tips

Ensure the parts have been thoroughly depowdered

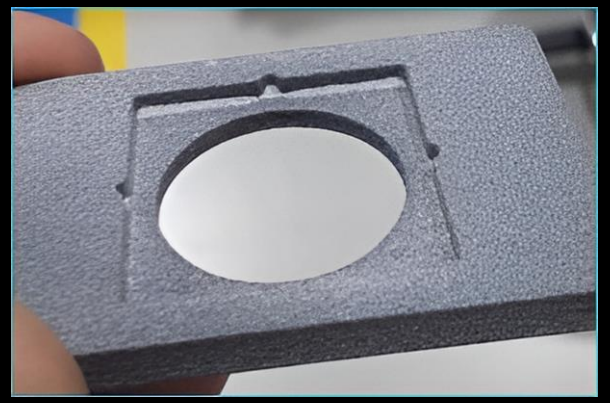
The must be **no powder** left on the parts, especially in internal cavities and around sharp features. In general, poor depowdering leads to bad smoothing results as the powder will cause imperfections as it processes.

If necessary, do a secondary blasting step to remove all residual powder from the corners and intricate shapes.

Ensure there is no contamination in the blasting media.

Poor blasting media can also result in contamination being applied to the parts, for this reason, it is important to ensure your blasting media is filtered/replaced frequently.

Please note that loose powder will fuse to the surface of the part and cause imperfections.





Pre-Processing Tips

Keep the Vapor Smoothing room clean!

Good housekeeping practices in and around the machine are crucial in preventing unwanted contamination. Parts surfaces are very sensitive to dust from the environment, and contaminated surfaces are highly visible after smoothing.

The processing chamber should be cleaned after every run using a “lint-free” wipe and IPA.

Contamination will occur if good housekeeping practices are not followed.





5. Hanging Tips

Hanging Tips

Recommended Hanging Equipment

- Use non-oxidizing materials like Stainless Steel or Nickel-Plated items.

- Commonly used items include:
  - 20 GA Stainless Steel Wire (0.75mm)
  - 28 GA Stainless Steel Wire (0.40mm)
  - Alligator Clips

- Avoid thick clips or hooks to reduce condensation and drip marks.







Hanging Tips

Design Considerations:

- Integrate sacrificial hooks into the design to facilitate easy hanging.
- Position hooks in non-critical areas to avoid witness marks on finished parts.

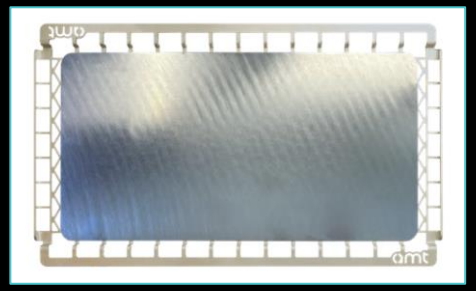


Hanging Tips

For the best results, the following hanging guidelines should be followed:

- Parts should be at least 40mm (1.6 inches) away from the chamber walls.
- Parts should be placed at least 20mm (0.8 inches) away from other parts, they must not touch.
- Cupping geometries should be hung with the openings facing downwards at a 10º - 20º angle.
- Contact points between the clips/wire and the part should be minimised to reduce the severity of witness marks after processing.
- Always make sure to place the diffuser on the top of the top rack inside the chamber to prevent drip marks.





6. Part Grouping

Part Grouping

What **Technology** was used to manufacture the parts?	SLS / MJF etc.
What is the **Material** of the parts?	PA12 -11 / TPU, etc.
What is the average **Wall Thickness** of the parts?	E.g. 1-2 mm / 3-4 mm / >5 mm, etc.
How **Full** is theprocessing chamber?	25% / 50% / 75% / 100% etc.

Part Grouping

Parts should be grouped taking into consideration the technology used to print them:

- Selective Laser Sintering (SLS)
- Multi Jet Fusion (MJF)
- Selective Absorption Fusion (SAF)





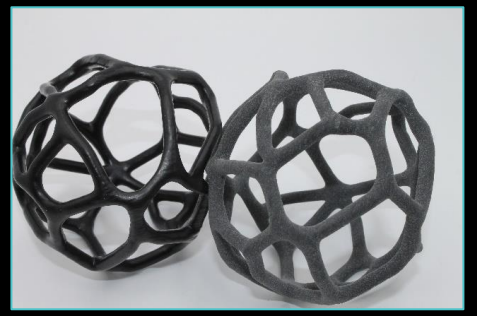
Part Grouping

Parts should then be grouped based on their material:

- Nylon 12 / PA12
- Nylon 12 / PA12 (Filled)
- Elastomers / TPU
- Nylon 11 / PA11











* On release, the SFX is only compatible with PA12.

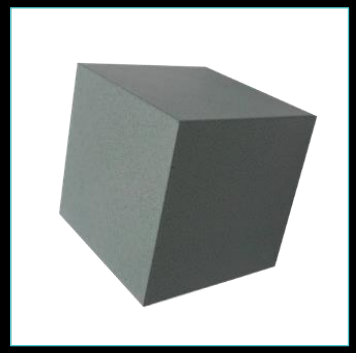
Part Grouping

Parts should be grouped based on their wall thickness (including unfused material):

- 1 – 2 mm
- 3 – 4 mm
- > 5 mm

THICK PARTS





THIN PARTS





Part Grouping

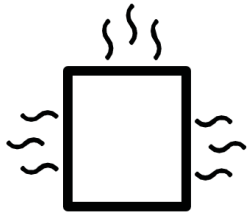
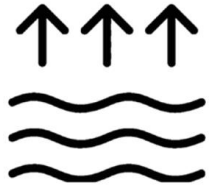
Unrelated to the part characteristics is the chamber fill level, this can be the following:

- 25% Full
- 50% Full
- 75% Full
- 100% Full
- Irregular Fill



7. How the Process Works

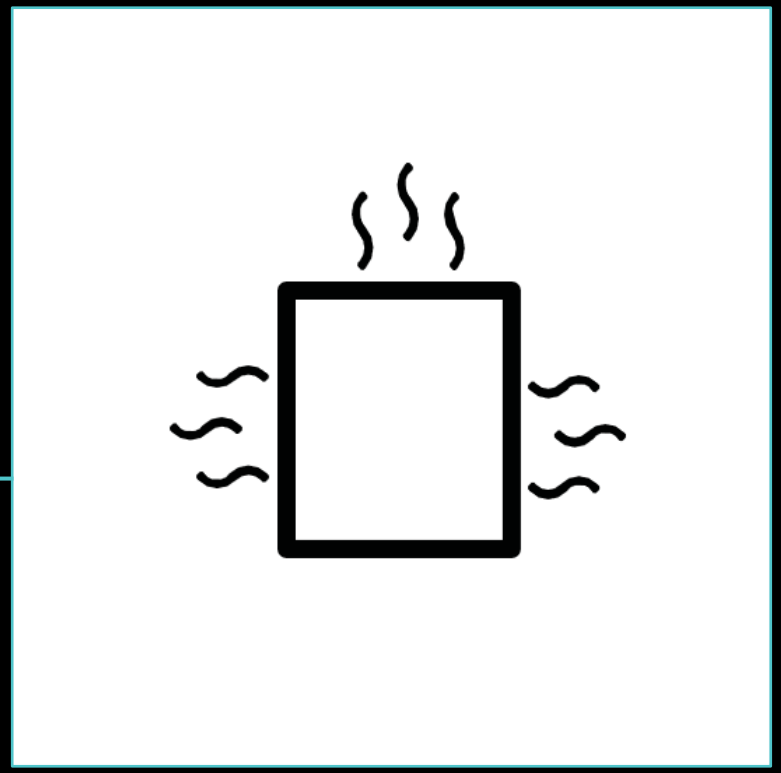
Process Steps Overview

Initialisation	Processing	Recovery	Curing	Drying
				

Step 1 – Initialisation

Machine Warm-up:
Ensuring optimal process environment.

Part Preparation:
Hang parts on the rack before the process starts.



Step 2 – Processing

Condition Parts:
Achieve desired operating temperature.

Introduce Solvent Vapors:
The solvent condenses on parts, initiating smoothing.



Step 3 – Recovery

Solvent Recovery:
Evacuate solvent to prepare for the next cycle.



Step 4 – Curing

Surface Hardening:
Apply gentle heat under controlled conditions.

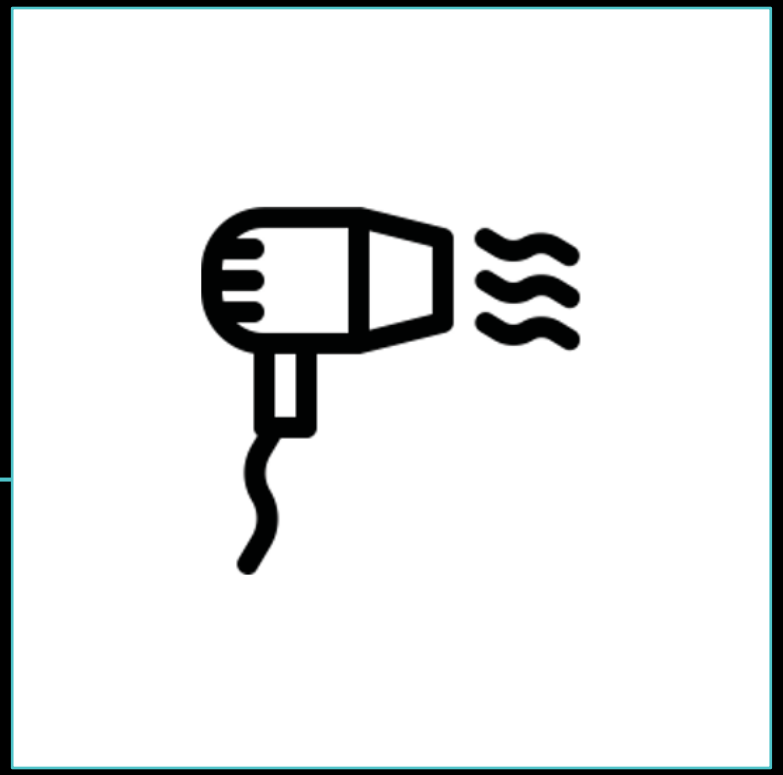
Restore Part Strength:
Hardening 'wet' surfaces to usability.



Step 5 – Drying

Remove Residual Solvent:
Ensure parts are completely dry.

Chamber Cleanliness:
Ready machine for subsequent batches.



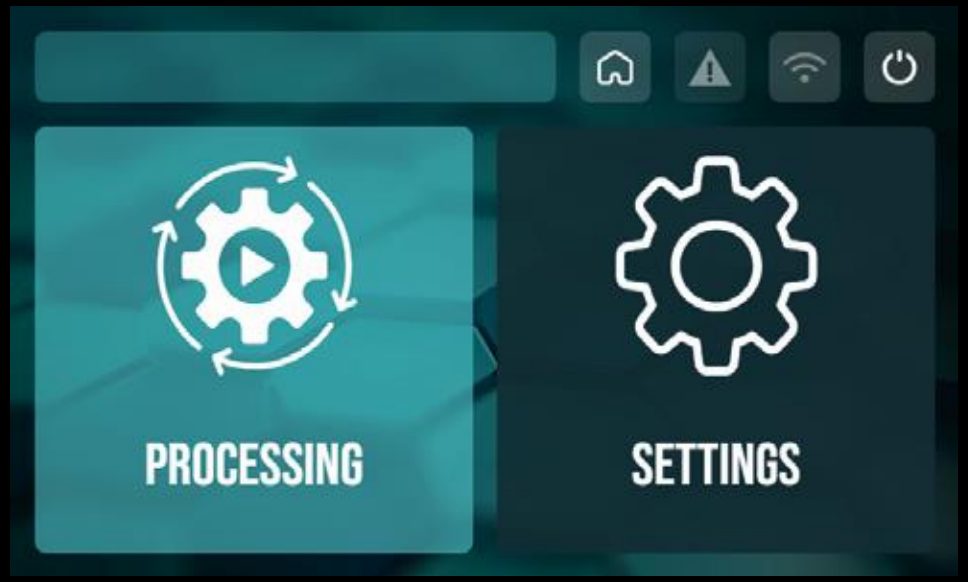
8. Running a Process

Running a Process

1. Power on the machine as per the user manual







2. Once loaded, press the “Processing” button.

Running a Process

3. Based on the part characteristics, fill in each section to define the recipe. Then press “Start Process”





4. Wait for the machine to initialize, you can cancel the initialization if needed.

Running a Process

5. When the machine is ready, open the door, load the parts and then close the door promptly. By pressing “OK” the process will start.





6. Wait for the process to finish, you can stop the machine if needed by pressing the “STOP” button.

Running a Process

7. When the process has finished, open the door, unload the parts and press the “OK” button.





8. Finally, rate the results and press “SEND”. You can then start another process or power down the machine.

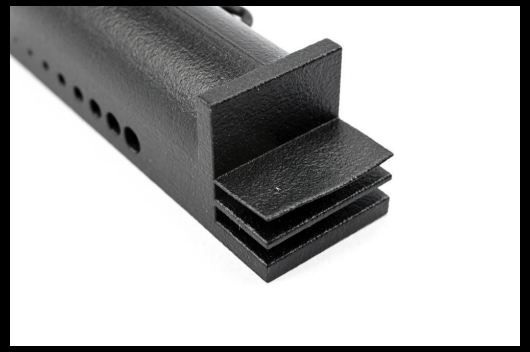
9. Troubleshooting

Recipe Troubleshooting

Un-Processed



Under-Processed



Over-Processed



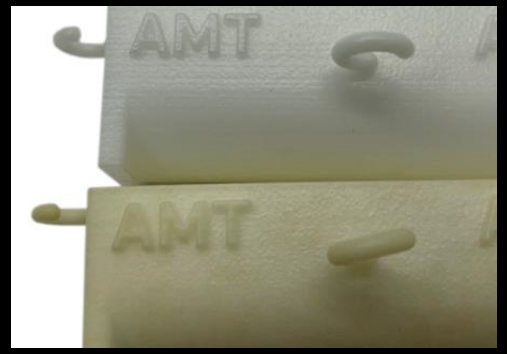
Contaminated



Drip Marks



Yellowing



Un-Processed Internal Areas



Un-Processed

What can cause this issue?

1. The material is not approved for use with the PostPro SFX and is not listed in the “Compatible Material List”.
2. The recipe used is not aggressive enough to smooth the parts.



How to fix it?

1. Check the material is listed in the PostPro SFX Compatible Material List.
2. Make sure that the fill, wall thickness and material are correctly defined on the recipe screen.
3. If the recipe parameters are correct, increase the “Intensity” of the recipe.

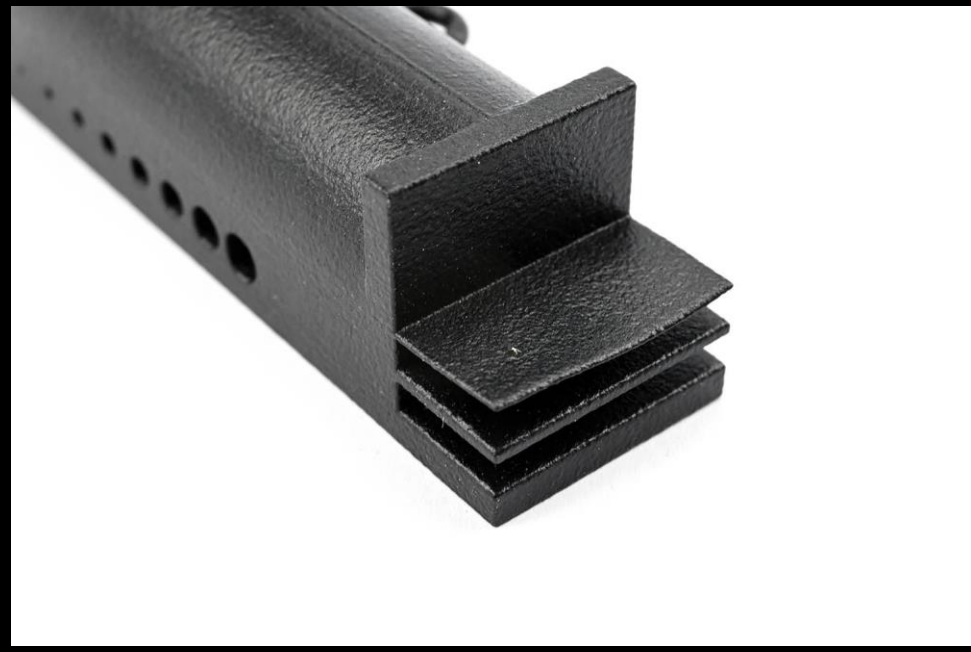
Under-Processed

What can cause this issue?

1. The recipe used is not aggressive enough to smooth the parts.
2. Depowdering was not completed effectively.

How to fix it?

1. Make sure that the fill, wall thickness and material are correctly defined on the recipe screen.
2. If the recipe parameters are correct, increase the “Intensity” of the recipe.
3. Ensure the parts have been thoroughly de-powdered.



Over-Processed

What can cause this issue?

1. The recipe used is too aggressive to smooth the parts.
2. Hanging orientation or method is not suitable.
3. Depowdering was not completed effectively.
4. Parts are not suitable for vapour smoothing.

How to fix it?

1. Make sure that the fill, wall thickness and material are correctly defined on the recipe screen.
2. If the recipe parameters are correct, decrease the “Intensity” of the recipe.
3. Adjust the hanging orientation or support the part better.
4. Ensure the parts have been thoroughly de-powdered.



Contamination

What can cause this issue?

1. The printing quality is poor, or the powder is contaminated.
2. Parts were not handled well.
3. There is contamination in the pre-processing or environment.
4. The chamber of the machine is not clean.
5. Parts were mixed during processing.



How to fix it?

1. Check that the printing media is clean and is running as per the manufacturer's recommendations.
2. Make sure to wear clean gloves when handling parts and avoid clothes which contain loose fibres.
3. Ensure that any de-powdering machines, storage boxes, workstations and hanging equipment are cleaned before use.
4. Clean the processing chamber as per the recommendations on the Knowledge Base.
5. Only run materials of the same colour in the same process.

Drip Marks

What can cause this issue?

1. The recipe used was too aggressive to smooth the parts.
2. Hanging orientation or method was not suitable.
3. The diffuser was not placed on top of the top rack.

How to fix it?

1. Check that the recipe parameters selected, such as wall thickness and fill level were correct.
2. Check that the correct FLEX Recipe was chosen.
3. Adjust the hanging orientation or support the part better.
4. Avoid hanging parts directly above one another.
5. Reduce the “Intensity” of the recipe to smooth the parts less.
6. Make sure the diffuser plate is on top of the top rack.



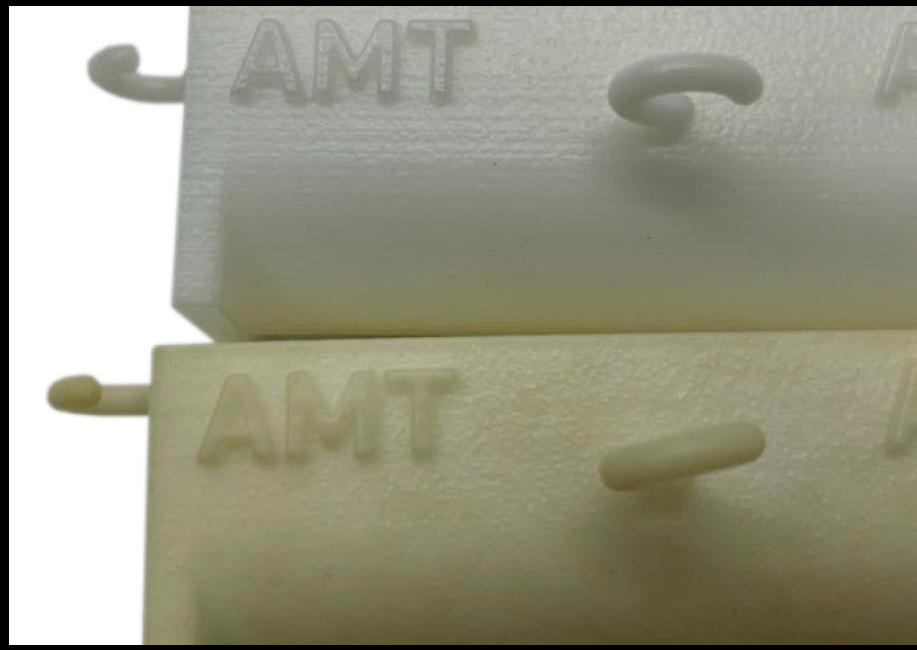
Yellowing

What can cause this issue?

1. Chamber and/or processing racks are dirty.
2. The recipe used was not correct for the parts.
3. Parts have not been handled well.
4. The printing process had an issue causing issues with colour.

How to fix it?

1. Clean the processing chamber and racks as per AMT recommendations, if running white parts, consider cleaning it more frequently.
2. Check that the recipe parameters selected, such as wall thickness and fill level were correct.
3. Check that the correct FLEX Recipe was chosen.
4. Only handle parts when wearing clean gloves and ensure that storage boxes are cleaned between use.
5. Check the printing conditions are as per manufacturers recommendations.



Un-Processed Internal Surfaces

What can cause this issue?

1. The recipe used is not aggressive enough to smooth the parts.
2. Depowdering was not completed effectively.
3. Hanging orientation or method is not suitable.

How to fix it?

1. Make sure that the fill, wall thickness and material are correctly defined on the recipe screen.
2. If the recipe parameters are correct, increase the “Intensity” of the recipe.
3. Ensure the parts have been thoroughly de-powdered.
4. Change the hanging orientation for the parts so that the opening is facing upwards, instead of downwards.



Thanks for Listening!

For more information contact AMT.

sfx-support@amtechnologies.com

Knowledge Base:

amtechnologies.com/sfx-support