

OUR EASY CHEAT SHEET

TO ACHIEVE 100% 3D PRINTING RELIABILITY

⌚ 5 Minute Read

Here's our advanced tips to ensure reliable 3D printing, every time.

More information for each tip can be found in our

RESOURCE CENTRE

Head to:
www.rigid.ink/resources

Invaluable 3D printing tips brought to you by

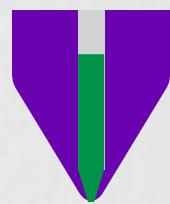


Step 1: Your 3D Printer

1 Clean Nozzle

It goes without saying that printer cleanliness and operational maintenance should be periodically carried out.

Remove carbon build up in nozzle with a nozzle cleaner or cleaning filament.



2 Bearings & Belts

Keep the bearings lubricated and belts tight – you can retro-fit a simple belt tensioner.



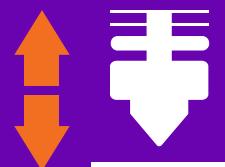
3 First Layer

Don't print your first layer too close to the bed, or you can back-wash block your nozzle if the filament cannot escape.



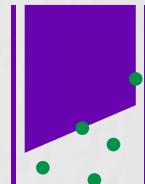
4 Hot Level

Only level your bed when both your extruder and heated bed are hot. When hot, these parts of your printer expand. So a bed levelled when cold is not actually calibrated for hot printing.



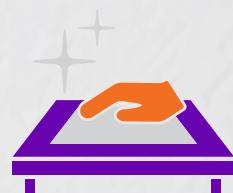
5 Bowden Tube

Ensure your Bowden tube is clean as it can quickly harbour dust particles. Sometimes it only takes a 0.2mm particle to block a 0.4mm nozzle.



6 Bed Surface

Ensure bed surfaces are maintained. Alcohol wipe down after each use and for PEI use fine grit sandpaper to clean surface every few prints.



Step 2: Environment

1 No Draughts

Keep draughts low where required to prevent cooling too fast (e.g. ASA), or use a desk fan to aid faster cooling where necessary (e.g. when printing bridges with PLA).



2 Temperature Swings

Watch out for wild fluctuations in ambient temperature. Printing in a garage in summer could result in temperature swings of 20°C between day and night, leading to warping and cracking.

A printer enclosure may help with this – ABS nearly always prints better in an enclosure, or a consistently warmer ambient room temperature.



3 Tidy Up

Ensure your environment is clean and not overly dusty.



4 Ventilation

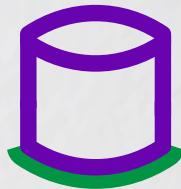
It goes without saying that you should always print in a well-ventilated environment, regardless of the printer or filament being used.



5 Don't Knock It

Smaller prints getting knocked off the bed during printing?

Use a skirt or brim to aid bed adhesion on tall & narrow or smaller surface prints.



Step 3: File/Slicer Settings

1 Watertight

Only use watertight 3D printer ready files. Sketchup is not suitable for 3D printing.

We recommend using approved printer-ready files where possible, from sites like MyMiniFactory.com



2 Check Files

If a 3D file is suspected to be unusable, quickly check it over using an online service like Netfabb.



3 Fast Layers Need Faster Cooling

If any layer takes less than 15 seconds to print (nozzle passing over the same point), consider slowing these layers down or increasing cooling (using a desktop fan).

Insufficient layer cooling times can lead to a print sagging.



Step 4: Filament

1 Clean Filament

Ensure filament is clean. A dusty environment can lead to dust on your spool.

If you have a dusty environment, or you're printing with an especially small nozzle size, use a clip-on filament cleaner to scrape off particles before the filament enters your extruder.



2 Nozzle Width

Composite materials print better with wider nozzles. Generally, 0.5mm+ nozzle sizes are optimum for composite filaments.



3 Use Uprated Nozzles

Composite materials (other than soft wood/woodfill) will wear down standard nozzles and filament feeder hobbled gears. Use uprated hardened nozzles and hobbled gears when printing with composite filaments, especially metal, glass or carbon fibre-filled filaments.

Ensure hobbled feeder gear is kept clean from particle build-up, or it will slip and you'll under-extrude.



4 Raft

If you're using a filament that's designed to have lower adhesion (e.g. Break-away), it will be easier to print using a raft.



5 Filament Quality

The single most important factor for reliable printing?

Using good quality filament.



6 Snap Test

To check if PLA is still fresh, do the snap test: see if a piece of the filament breaks by bending it back on itself. It should fold without snapping. If it snaps, throw it away – it's gone stale.

Usually, PLA should be replaced 6 months after opening, but good quality filament stored under the correct conditions (e.g. airtight bag/container, out of direct light) can last much longer.



7 If In Doubt, Dry It Out

Dry out older filament, or filament exposed to air for long periods, before using. Most FDM filaments are hygroscopic, meaning they absorb water. Always dry Nylon before use, as this absorbs the most moisture.



8 Firmer Filaments

If using a 'regular' (non-flexible) extruder to print flexible filament, use the firmest filament you can, around 95A Shore hardness (e.g. TPU), or those with less friction (e.g. Flexible PLA).

These will be much easier to print with.



9 Don't Leave It Hot

When using soluble support filaments like PVA, if the filament will be waiting in the nozzle for extended periods of time, bring the extruder temperature down by around 30°C while it's on standby. Hot molten PVA left in the nozzle at printing temperature for long periods of time can lead to blockages.



10 Storage

Filament should be stored in a cool, dark place when not in use, ideally in one of our special Mylar metallic bags. UV light and warm temperatures will degrade your filament over time.



11 Low & Slow

Always print flexible materials at a slower speed. As a rule of thumb, try at about half the speed you would print standard materials, such as PLA or ABS.



12 Keep It Tight

When unspooling and loading filaments, always keep hold of the end so there's no slack and it cannot unravel, even just a small amount. Loosened rings of filament can expand around your spool and fall over the more tightly-wound filament, causing it to lock up during printing. Similarly, ensure your spool holder is not too loose or allowing excess slack when printing, as this will cause the same issue.

If in doubt, add a small amount of resistance to your spool holder using some cardboard between the spool and the side of the holder. This will keep the spool in constant tension with the printer and minimise the risk of your prints failing.



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