

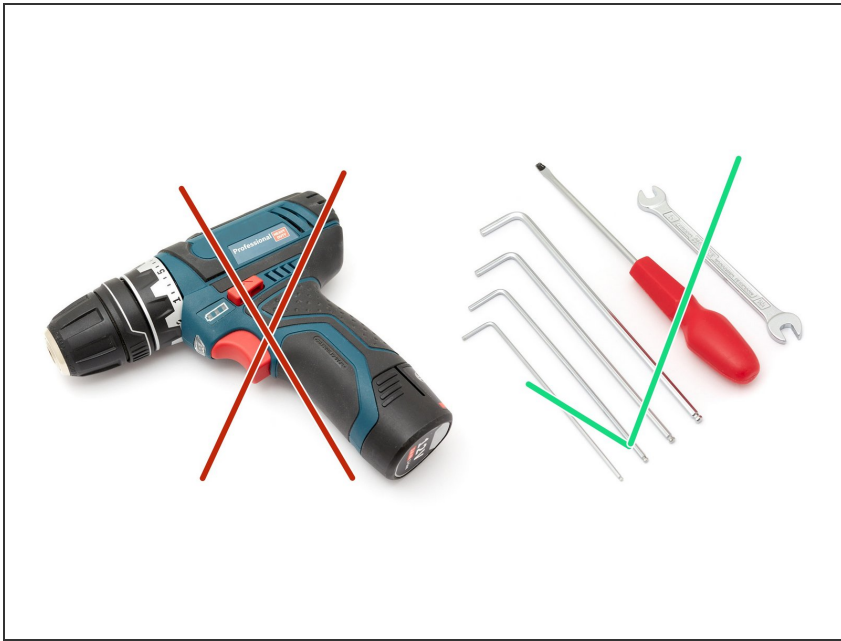
Bear Lab

01. Tools

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Step 1 — No power tools



⚠ Do not use power tools for the whole assembly or you might damage hardware. Always use hand tools.

i Tightening torque values recommended:

- **Max 4.5Nm** for M5 screws on metal to metal assemblies (e.g. joining plate on an extrusion).
- **Max 1.5-2Nm** for M5 screws on printed part to metal (e.g. *y_rod_holder.stl* on extrusion).

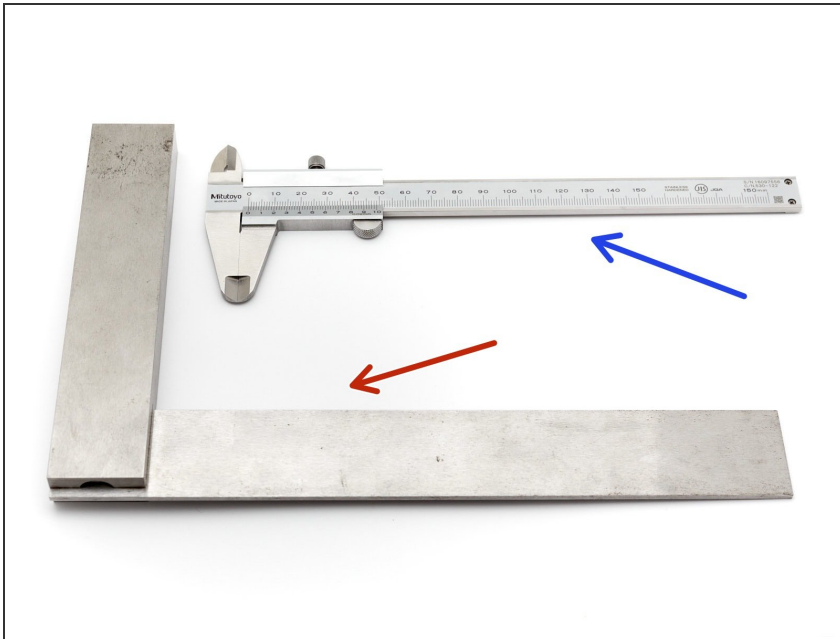
Step 2 — Mandatory tools



i This step and the next one list the **mandatory** tools you need to build the Bear frame.

- Small pliers with cutting capabilities
- Hex key 1.5mm for MK2(S) and MK2.5(S) only, not useful for MK3(S).
- Hex key 2mm.
- Hex key 2.5mm. Ball end would be very useful.
- Hex key 3mm.
- Spanner 5.5mm
- Slotted screwdriver #1

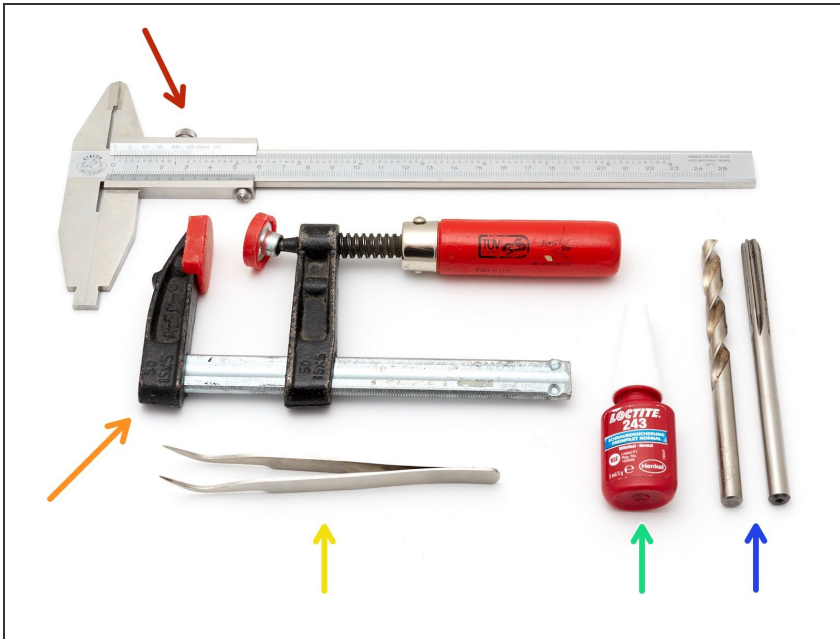
Step 3 — Mandatory tools



- i** This step and the previous one list the **mandatory** tools you need to build the Bear frame.
- Having a quality square will help you to build the Bear precisely. We recommend a **200mm long machinist precision square**, ideally with standard DIN 875 / BS 939 (any grade).
- i** If you don't have such a square or want to use a lower quality one, check these videos on how to test and fix your square:

 - *How to Square a Square* by Wesley Treat:
<https://youtu.be/FNpAQHrNpNU>
 - *How to Square a Square and Make it True* by Wood By Wright:
<https://youtu.be/enEYzTXg2Jg>
- Caliper, 150mm long minimum. If you don't have a caliper you can use a steel ruler. (A vernier caliper is generally more accurate than a digital caliper, at the same price point.)

Step 4 — Optional tools

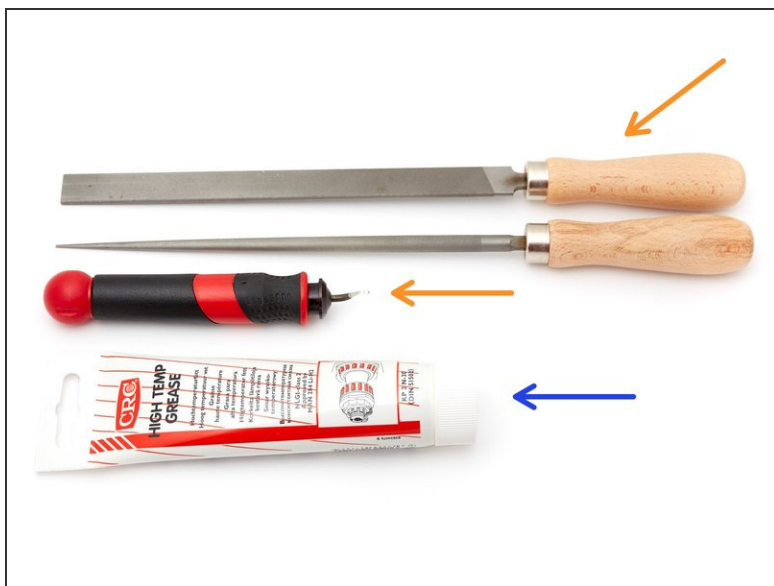


i This step and the next one list the **optional** tools that can be helpful during assembly. You can build the Bear frame perfectly without them.

★ Sorry for this extra list, we love tools...

- A long caliper of 200mm or more helps to align the Y axis smooth rods spacing on any "Prusa type" printer.
- A general purpose clamp will facilitate the squaring of the frame when using a machinist square.
- Tweezers are always useful :)
- You can add a dab of blue Loctite #243 to the screws during assembly to prevent them from unscrewing.
- An 8mm drill bit or 8mm reamer can be useful in case the smooth rods holes on Z axis are a bit too tight.

Step 5 — Optional tools



i This step and the previous one list the **optional** tools that can be helpful during assembly. You can build the Bear frame perfectly without them.

- Files and deburring tool can be helpful to clean the printed parts.
- It is good practice to re-grease the bearings during the assembly.
- i** We recommend the use of a lithium based lubricant that has a viscosity between 50 and 100mm²/s at 40 °C, NLGI class 2 and a thermal resistance of 100°C or more.
- A torque tool can be useful to ensure you apply max torque without damaging hardware.
- i** We recommend max 4.5Nm for the metal to metal assemblies (e.g. joining plate on an extrusion) and max 1.5-2Nm for printed parts (e.g. *y_rod_holder.stl* on extrusion).

Step 6 — Optional parts



- Before starting to disassemble your printer, did you see we have a list of optional parts for the Bear frame?
 - [Official optional parts](#)
 - [Community's optional parts](#)

Step 7 — Next chapter



- Congratulations you have finished this chapter and are ready to start with the disassembly :-)
- Got to the next chapter: [02. Preflight check and disassembly](#)