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1. Introduction

STEP 1 Important

- **Congratulations on your purchase of the assembled Original Prusa MK4S with MMU3!**
- **This guide is dedicated only to the set of assembled MK4S with MMU3 from factory.** If you ordered only assembled MMU3 unit and purchased the printer separately, please use this guide Original Prusa MMU3 Assembly

⚠ Even though this is an assembled version, **there are still a few accessories to assemble before you can start printing:**

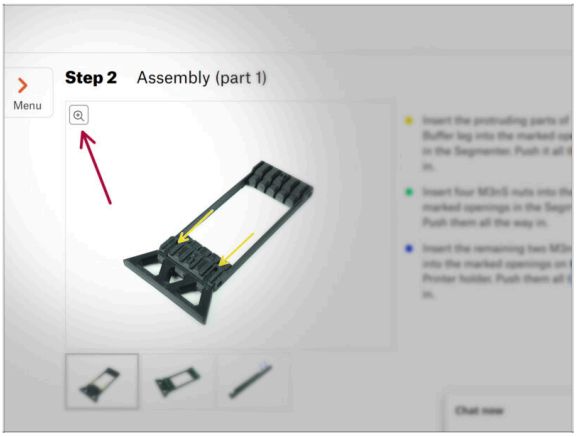
- Cassette Buffer Assembly
- Spool Holder Assembly (5x)

- Follow the instructions carefully, and proceed with the assembly.

STEP 2 Tools required

- **The following chapters require:**
- 2.5mm Allen key
- Side cutters

STEP 3 View high resolution images

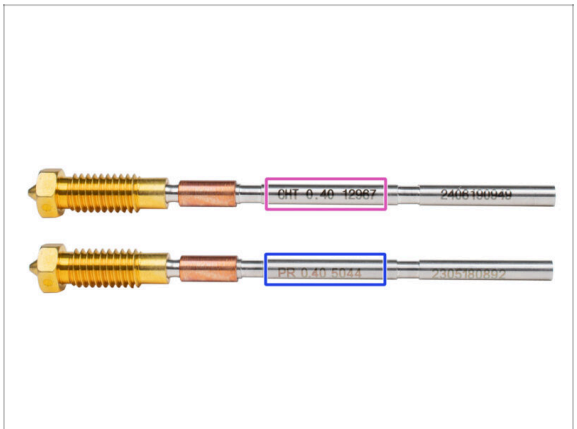


- When you browse the guide on help.prusa3d.com, you can view the original images in high resolution for clarity.
- Just hover your cursor over the image and click the Magnifier icon ("View original") in the top left corner.

STEP 4 Labels guide

- All the boxes and bags containing the parts for the build are labeled.
- Most of the part drawings on the labels are scaled 1:1 and can be used to identify a part.
- You can download and 2D print a Prusa Cheatsheet with the 1:1 scaled fastener drawings. help.prusa3d.com/cheatsheet. Print it at 100 %, don't rescale it, otherwise, it won't work.

STEP 5 Prusa Nozzle info



⚠ There are two variants of the Prusa Nozzle that we ship with the printers:

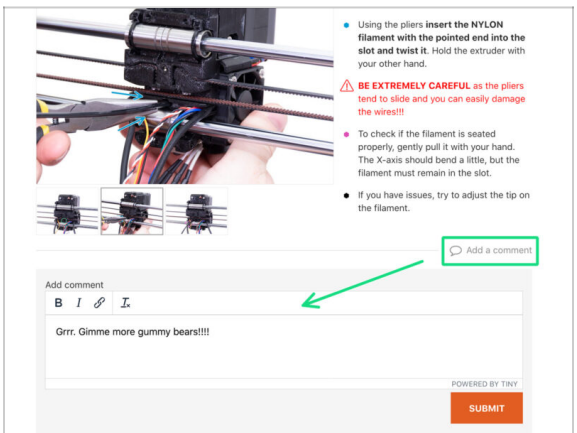
- Prusa Nozzle brass CHT high flow *(marked CHT)*
- Prusa Nozzle brass *(marked PR)*

- Your MK4S came equipped with the Prusa Nozzle brass by default.

ⓘ While it is possible to print with the Prusa Nozzle CHT, please note that specific settings are required for high quality prints.

- The Prusa Nozzle CHT is also included in your MMU3 package.
  - To replace the nozzle on the MK4S, please follow the instructions provided in the dedicated manual How to replace the Prusa Nozzle (MK4S/MK3.9S).

STEP 6 We are here for you!

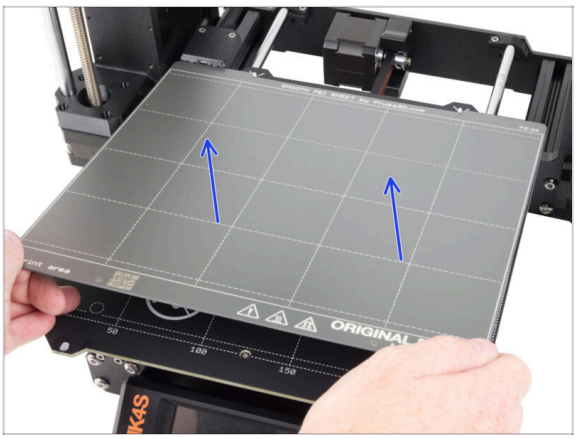


- Lost in the instructions, missing screw or cracked printed part? **Let us know!**
- You can contact us using following channels:
  - Using our 24/7 live chat
  - Or by writing an email to info@prusa3d.com
  - Or, you can use the comments under each step.

STEP 7 Prepare your desk

- Tidy up your desk! Tidying up decreases the probability of losing small parts.
- **Clear your workspace.** Make sure you have enough room. A nice clear flat workbench will get you the results you are aiming for.
- **Let there be light!** Make sure you are in a well-lit environment. Another lamp or even an extra flashlight will probably come in handy.
- Prepare something to contain the plastic bags and the removed packing materials so you can recycle them afterwards. Make sure there are no important parts being discarded.

STEP 8 Preparing the printer



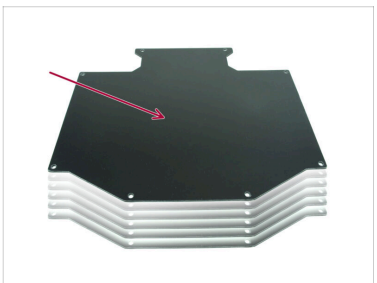
- Carefully remove the test print from the print sheet.
- Remove the print sheet and put it aside for a while.
- All set? Let's move on to the next chapter: **2. Cassete Buffer Assembly**

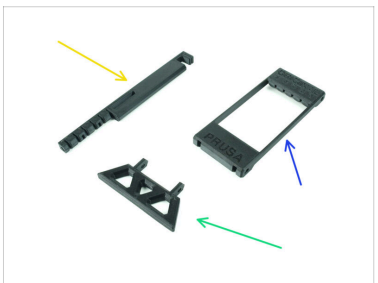
2. Cassete Buffer Assembly

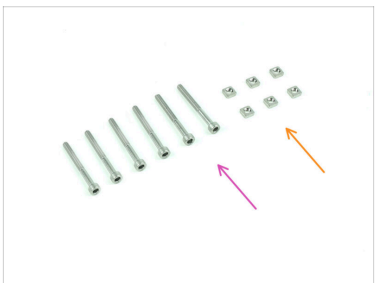
STEP 1 Tools necessary for this chapter

- **Please prepare tools for this chapter:**
  - 2.5mm Allen key for M3 screws

STEP 2 Parts preparation

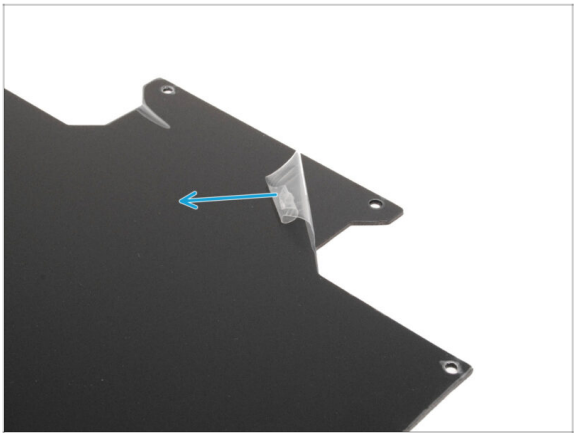






- **For the following steps, please prepare:**
- Buffer plate (6x)
- Printer holder (1x)
- Buffer-leg (1x)
- Segmenter (1x)
- M3x30 screws (6x)
- M3nS nuts (6x)

STEP 3 Peeling the plates

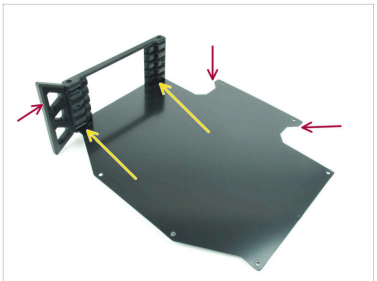


- Peel the **protective layers off the both sides** of the buffer plates.

STEP 4 Assembly (part 1)

- Insert the protruding parts of the Buffer leg into the marked openings in the Segmenter. Push it all the way in.
- Insert four M3nS nuts into the small marked openings in the Segmenter. Push them all the way in.
- Insert the remaining two M3nS nuts into the marked openings on the Printer holder. Push them all the way in.

STEP 5 Assembly (part 2)

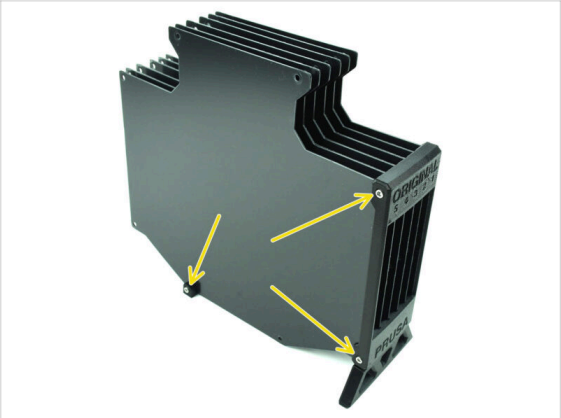


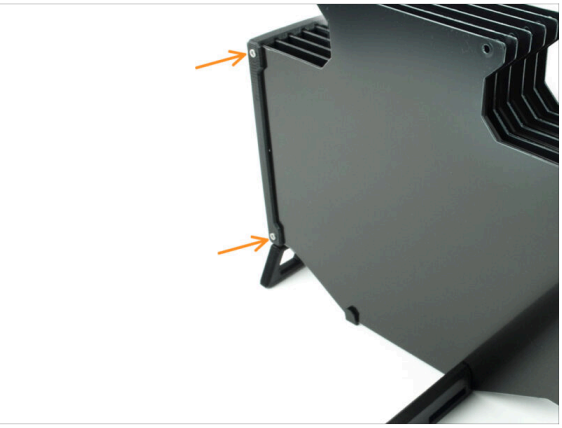
- Insert the first buffer plate into the marked bottom opening in the Segmenter. Push it all the way in so that the screw openings line up.
- Make sure the buffer leg and the cutout parts of the sheet are on opposite sides - as seen in the picture.
- Attach the printer holder to the marked position on the buffer sheet. For now, it should be pointed up. The sheet should attach to the bottommost opening in the printer holder.
- Orient the whole assembly so that the buffer sheet is standing up. Both the printer holder and the Leg should be on the ground.

STEP 6 Assembly (part 3)


- Insert the remaining 5 buffer plates into the corresponding openings on the Segmenter and Printer holder.
- The whole assembly now should look like the one in the second picture.

STEP 7 Assembly (part 4)





- Insert three M3x30 screws into the marked openings on the side of both the Segmenter and the Printer holder. Tighten them up.

ⓘ If the screw doesn't go in, make sure all the holes align with the plates.

⚠ Do not overtighten the screw. Otherwise, the buffer plates might deform.

- Attach another two M3x30 screws into the openings on the other side of the Segmenter.

STEP 8 Assembly (part 5)

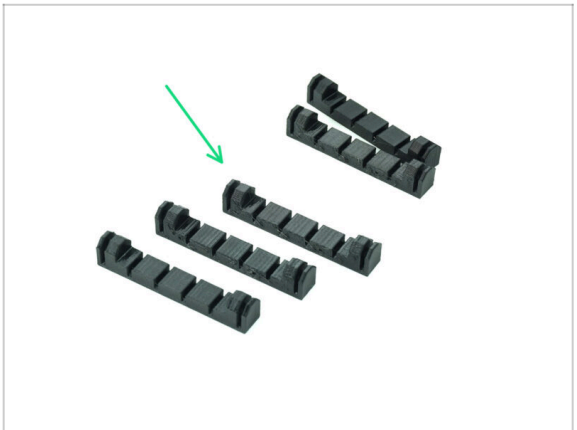
- Insert the last M3x30 screw into the marked opening in the Printer-holder.

ⓘ Note that some versions of the part may have the opening on the opposite side, but the assembly process remains the same.

⚠ **Do not overtighten the screw.** Otherwise, the buffer plates might deform.

- Push the screw into the assembly until it reaches the nut. Tighten it up.

STEP 9 Parts preparation: Plate-holders

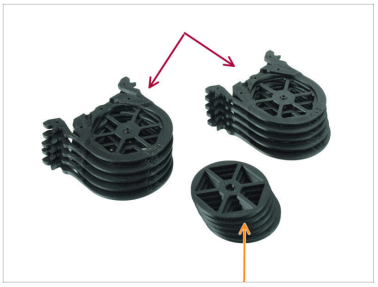
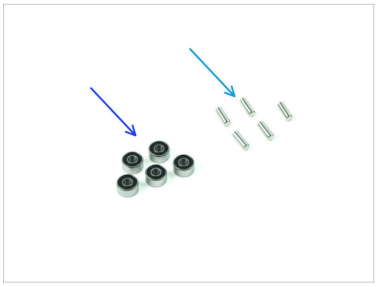
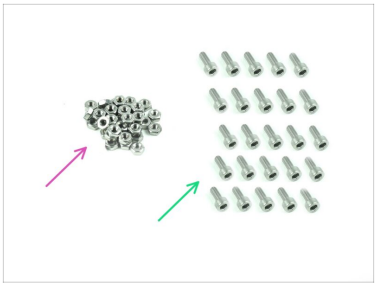


- **For the following steps, please prepare:**
- Plate-holder (5x)

STEP 10 Assembly (part 6)

- Attach the plate holders to the plates in the marked positions.

STEP 11 Buffer segment parts preparation

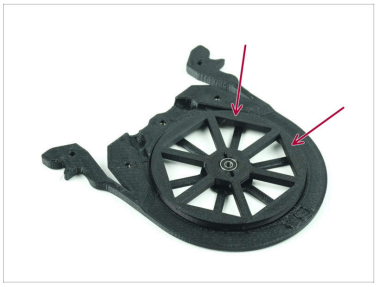




- **For the following steps, please prepare:**
- Buffer Segment (10x)
- Wheel (5x)
- Ball Bearing 693-2rs (5x)
- Shaft 2.9x8.5 (5x)
- M3n nut (15x)
- M3x6 screw (25x)

STEP 12 Segment assembly (part 1)

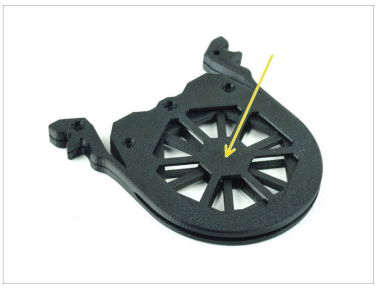
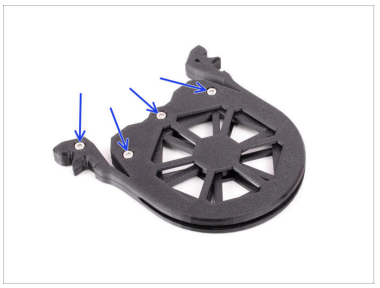
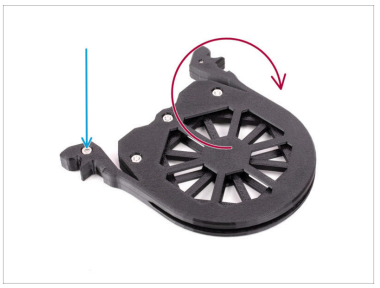

- Insert the **bearing** into the center opening in the wheel.
- Make sure the bearing is inserted all the way in, until flush with the surface.
- Repeat for the remaining four wheels.

STEP 13 Segment assembly (part 2)

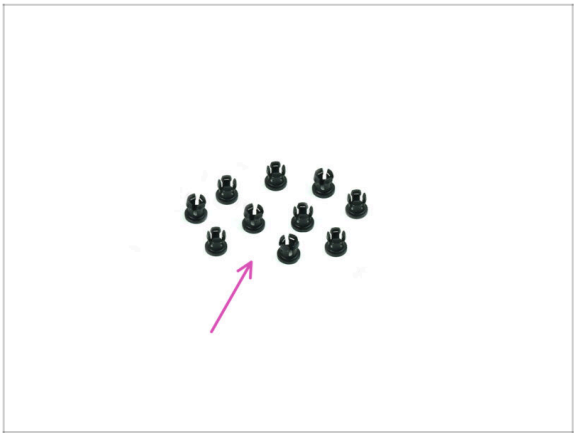

- Insert three **M3n nuts** into the marked openings on the Segment and push them all the way in.
- Add the wheel into the center of the segment.
- Push the **Shaft** all the way through the middle of the bearing, until it engages into the segment below.

STEP 14 Segment assembly (part 3)

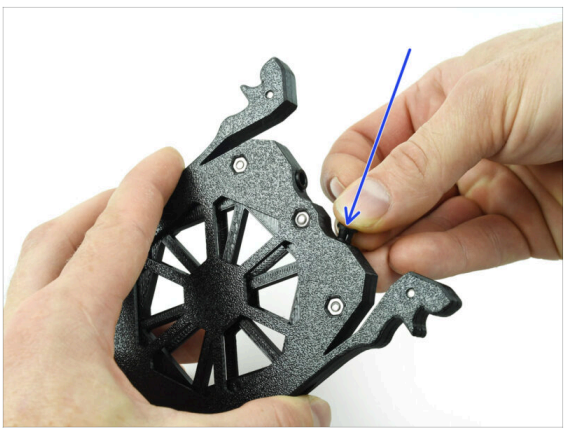
- Cover the assembly with another **Segment** part. Push both parts together to make sure the center shaft engaged into the top segment too.
- Join both parts together using four **M3x6** screws.
- Turn the assembly around.
- Add the fifth **M3x6** screw from the other side.
- **Assemble all the remaining segments**, using the same technique.

STEP 15 Collets: parts preparation



- **For the following steps, please prepare:**
- Collet (10x)

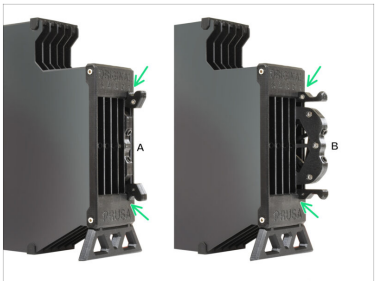
STEP 16 Collet installation



- Insert one of the **collets** into the marked position on the cartridge.
- ⚠ Note, for an easier instalation, you might want to squish the small fins together while you insert the collet into the opening. Otherwise, one of the fins might spread outwards, resulting in a damaged collet.
- Insert another collet into the other opening.
- Install collets into the remaining four cartridges too.

STEP 17 Cartridge installation

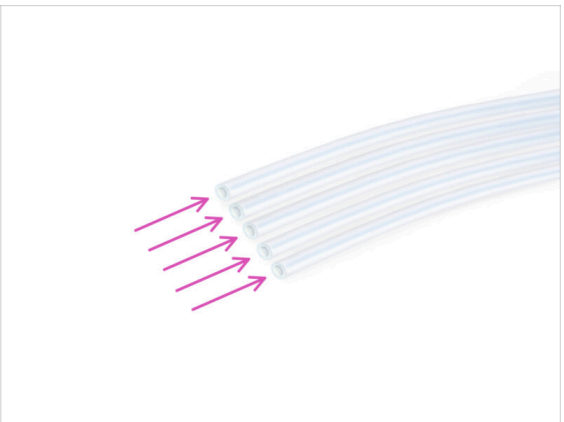




- Now, prepare all 5 cartridges and the buffer body.
- Take one of the cartridges and hold it by the two handles. Squish the handles together for insertion.
- Insert the cartridge into the buffer body.
- Make sure the cartridge is properly inserted.

  For a later cartridge removal, squish the two handles together and pull it out.
- Insert **all the cartridges** into the buffer body.

STEP 18 PTFE tubes parts preparation




- **For the following steps, please prepare:**
- PTFE 650mm (5x)
- PTFE-clip (1x)

STEP 19 PTFE tubes installation

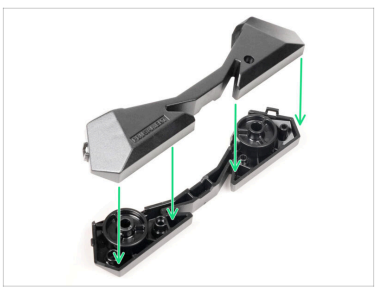
- Insert the PTFE tubes into the upper collet in each of the cartridges. Push them all the way in.
- Join the PTFE tubes together using the PTFE clip approximately in the middle.

3. Spool Holder Assembly

STEP 1 Injection molded holder parts preparation

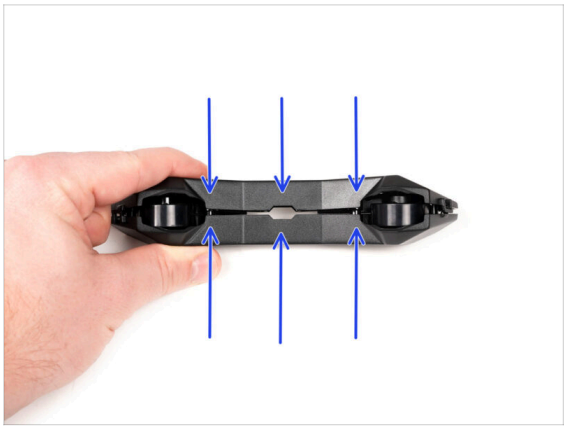
- **For the following steps, please prepare:**
- Spool holder Base (4x)
- Spool holder Guide (1x)
- Spool holder Wheel (4x)
  - ⓘ Wheels shipped after April 2024 are made of POM. We recommend using this version over the earlier models made from ABS.
- sheet of Foam Pads (1x)
- PTFE holder (1x)

STEP 2 Base assembly (part 1)



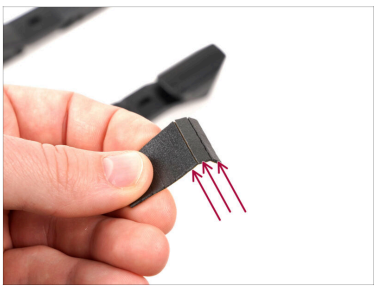
- Take one Base part. Arrange it as seen in the picture.
- Insert two wheels into the Base.
- Cover the assembly with another Base part on top.

STEP 3 Base assembly (part 2)



- Push both Base parts together until they fully engage one into the other.
- Verify the Base parts hold together properly.
- Repeat the same steps for the other side part of the spool holder, until you get two of these.

STEP 4 Foam pads installation (part 1)



- Take the foam pad sheet. Bend it to separate the individual foam pad strips.
- There is a bending line inside the inner opening on the bottom of the spoolholder side part.
- Attach an individual foam pad strip onto the middle of the bending line inside the opening, as seen in the picture.

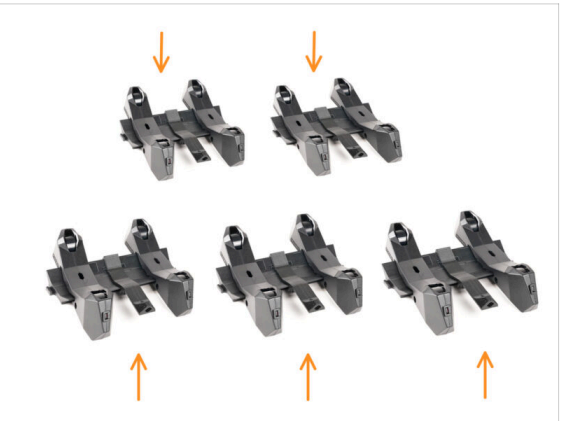
STEP 5 Foam pads installation (part 2)

- Attach another four foam pad strips onto the marked positions on the bottom of the spool holder side part.
- Install another six foam pad strips onto the other side part of the spool holder.

STEP 6 PTFE holder assembly

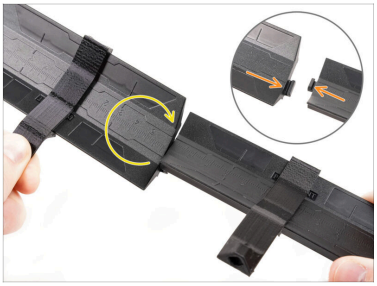
- Take the spoolholder Guide part. Hook the end of the PTFE holder onto the Guide
- Make sure the longer part of the PTFE holder is located at the narrower side of the Guide part.
- Push the PTFE holder down onto the Guide until it fully engages and locks in place.

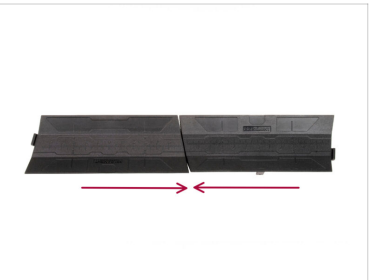
STEP 7 Finishing up the Spoolholders (inj. mol.)

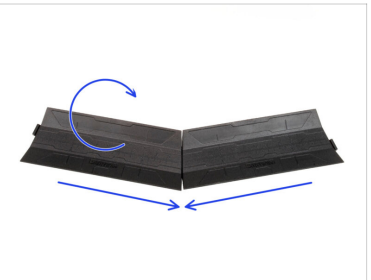


- Slide the side parts onto the Guide part.
- Repeat the same steps for the remaining Spool holders, until you assemble all five. (Don't forget about the foam pads on the bottom!)

STEP 8 Joining the Spoolholder Guides





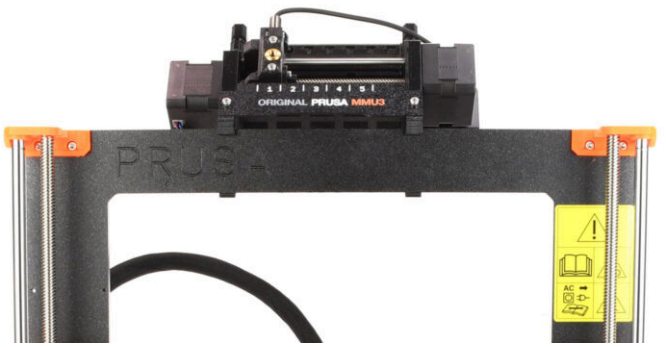


- There are protrusions on each side of the Guide part.
- Using these protrusions, the Guide parts can be joined together. To join them together, simply tilt in the Guide parts one into the other until the protrusions click in.
- The Guides can be joined together in form of a straight line.
- Or, if you flip one of the Guides around, they can be joined in an arc pattern. This is handy to form an arc of spool holders around the Buffer so that each filament path is as straight as possible.

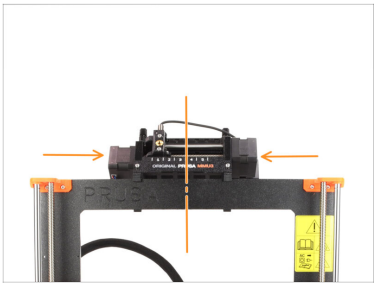
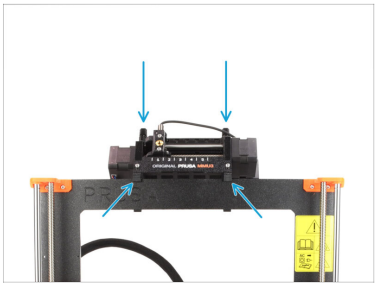
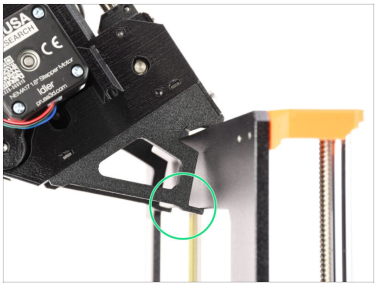
STEP 9 Injection molded spoolholder: parts preparation

- Congratulations! You successfully assembled **all five spool holders**.
- Now, continue in the chapter: **4. Preparing the assembly**

4. Preparing the assembly



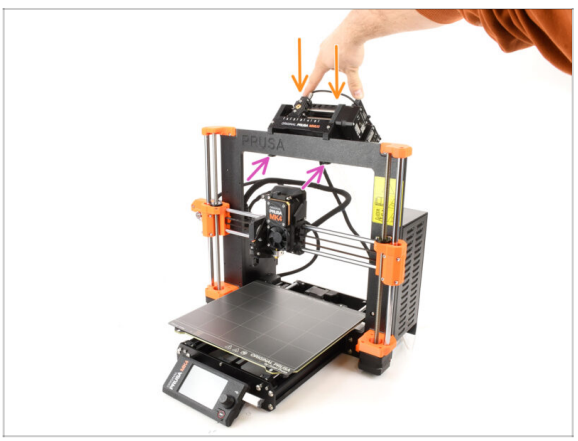
STEP 1 Attaching the MMU unit (part 1)

- The MMU3 unit should be placed onto the top part of the printer's frame.
- Place the MMU3 unit onto the frame.

  Attach it just by the top hooks.
- Look from behind, there are "clamps", which will be used to lock the unit to the frame in the next step.

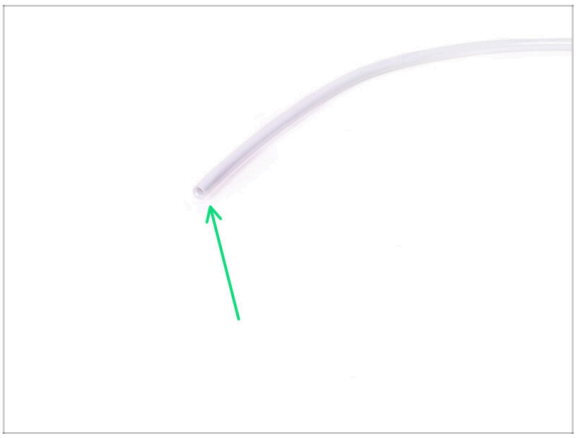
STEP 2 Attaching the MMU unit (part 2)



- Press the back part of the MMU3 unit downwards slightly, until the clamps lock to the frame.
- Check that both bottom clamps on the unit are fully engaged.

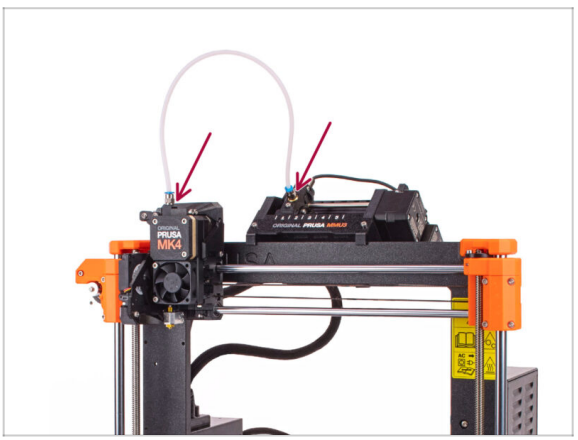
ⓘ If you need to remove the unit from the frame, simply lift the back part up to disengage the clamps.

STEP 3 MMU-to-Extruder PTFE tube parts preparation



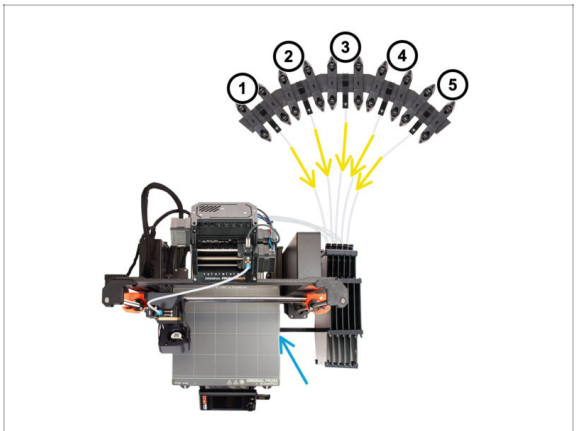
- **For the following steps, please prepare:**
  - 360x2.5mm PTFE tube (1x)

STEP 4 MMU-to-Extruder PTFE tube



- Attach the PTFE tube onto the printer by inserting it into the fittings. One end goes onto the selector. The other goes onto the extruder.
- Tighten the fittings up using the Uniwrench, if necessary.

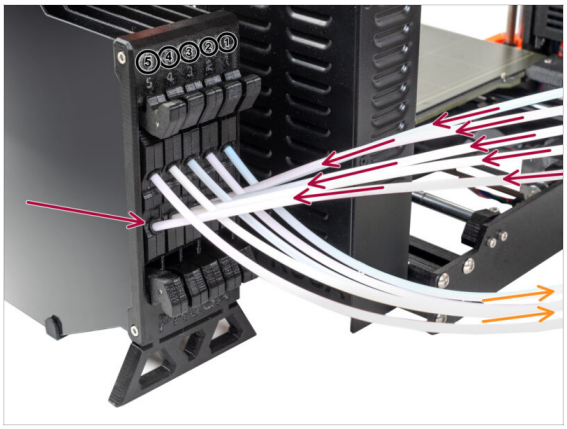
STEP 5 Spoolholders setup



- The Buffer and spools setup in the picture is the one we will be trying to achieve. Arrange the **spool holders** and the **buffer** as seen in the picture.
- Hook up the "printer holder" part on the buffer to the extrusion on the printer.
- The PTFE tubes should go from the spoolholders to the buffer. Then, from the buffer to the back of the MMU.

⚠ Note the spool holder positioning. It is important that filament has **as straight path as possible** and that nothing interferes. PTFE tubes should **not be bent too much**. Otherwise, the filaments will jam.

STEP 6 Spoolholder-to-Buffer PTFE tube



- Connect the PTFE tubes **from the MMU** unit to the **BOTTOM row of collets** on the buffer, ensuring you match the numbering on both the buffer and the MMU unit.
- Attach each end of the PTFE tube from the Buffer to the PTFE holder on each Spool holder.

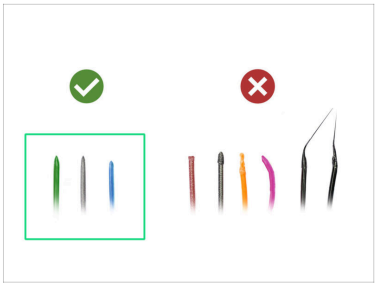
  Make sure each spool holder is hooked up to the corresponding filament position number. (marked 1 to 5 on the MMU unit and the buffer.)

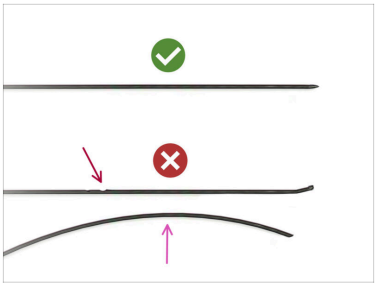
⚠ The MMU3 for MK4S necessitates the use of the latest version of the buffer components. If you're using an older version, it's essential to rebuild the device using the most recent version available.

- Now it's time to get closer to printing. Let's move to the next chapter.

5. Preflight check

STEP 1 Filament preparation





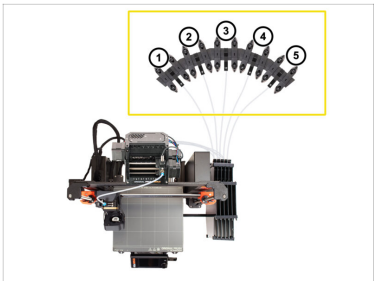
⚠ Your **assembled MK4S with MMU3 bundle** has been calibrated and tested in our factory. However, a few easy checks are still required.

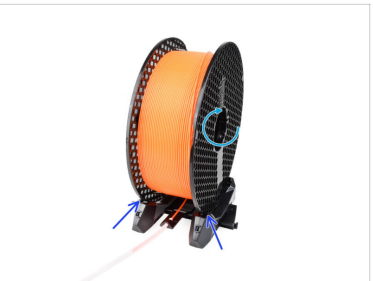
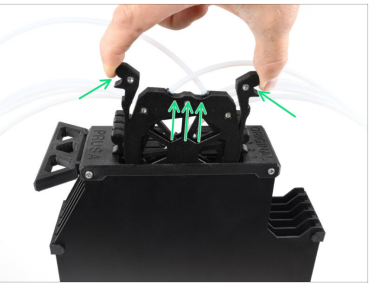
We can now move on to loading the filaments in and printing the test object! But first;

- Please prepare at least **five different PLA filaments** and **cut off the ends** to form a round **sharp tip** on each - as seen in the picture.
- The filaments must have a **sharp tip** in order to load properly into the MMU as well as into the printer. If the tip is deformed, bent or larger in diameter, it won't load properly.
- Inspect the last **40cm** (15") of each filament. Make sure there are **no dents** in it. Sometimes, if filament got jammed before, the pulley wheel makes an indent in it. This part of the filament can no longer be grabbed and moved by the MMU unit and must be cut off.
- If the filament end is bent, straighten it. **It must be perfectly straight.**

⚠ Use only high-quality filament with guaranteed low diameter deviation. In case you have filament loading / unloading issues in the future, re-visit this step as well. Make sure the filament is dried up. Moisture-sensitive filaments can be problematic during the MMU operation.

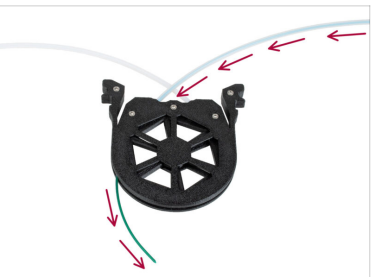
STEP 2 Suggested filament layout



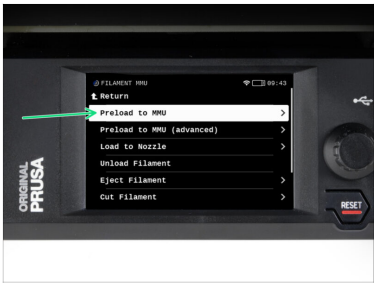
- Lay down the five filaments onto the spool holders. Make sure the spools do not interfere one with another.
  - ⓘ Filament positions are labeled **1,2,3,4,5** from the left to right, from the user's point of view.
  - Adjust each spool holder so that the spool fits the rollers correctly.
  - Verify the spool is **able to rotate freely** and nothing interferes.
- Take the cassette for **Filament 1** out of the buffer.

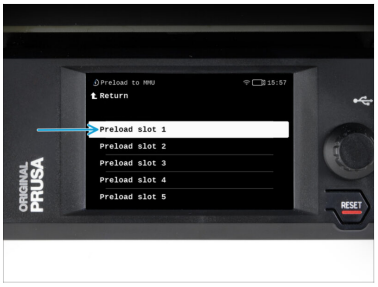
STEP 3 Loading a filament through the buffer


- Insert the **tip of the filament 1** into the bottom PTFE tube attached to the spoolholder.
- Keep pushing the filament into the PTFE tube until it appears in the corresponding buffer cassette.
- Take the tip and insert it through the cassette into the other PTFE tube, which goes into the MMU unit.

STEP 4 Preloading filaments to MMU



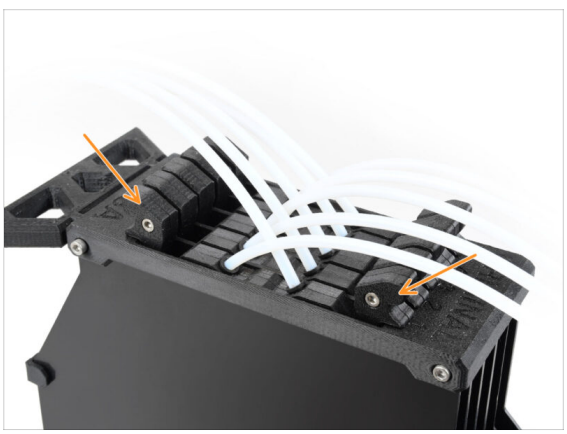


- On the printer, go to the **Filament -> Preload to MMU**
- Select **Filament slot 1**. The MMU unit will engage the idler into the first position and start rotating the pulley until the filament is loaded in.
- Keep pushing the corresponding filament end into the PTFE tube from the buffer into the MMU, until you feel the filament being pulled in.

⚠ Remember, the filament tip must be straight and sharp in order to load it properly.

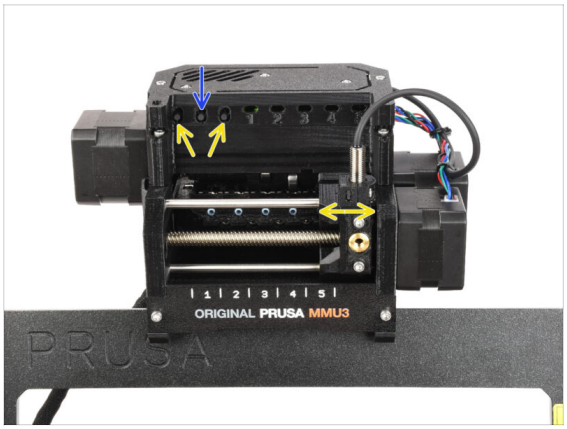
- Repeat the same process until you load all **five** filaments.

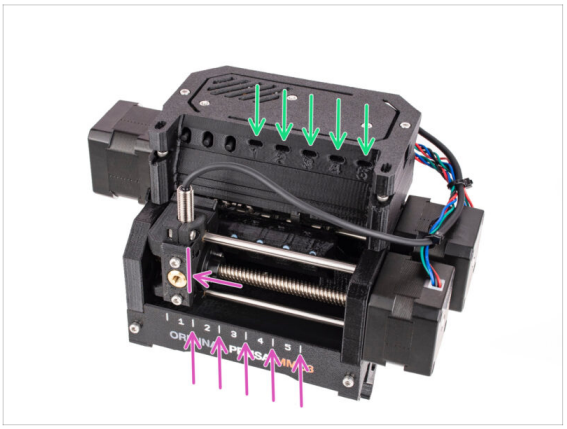
STEP 5 Closing the buffer



- After a given filament is successfully loaded into the MMU, return its cassette back into the buffer.
- Repeat the same process for the other filament positions, until you successfully load **all five filaments** into the MMU.

STEP 6 Pro tip: Loading using the buttons.

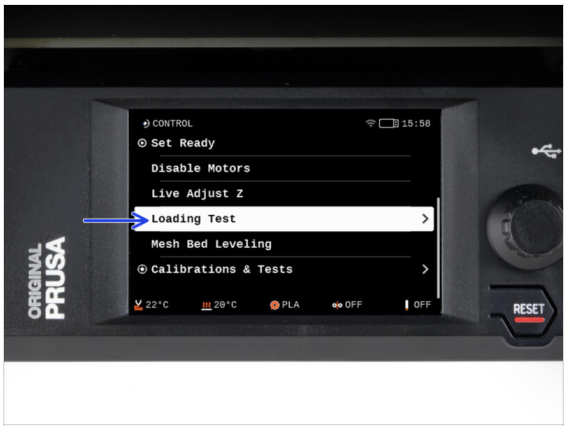




- You can also load a filament into the MMU using the buttons on the unit. Next time you load a filament, use the method you prefer. Either from the LCD menu, or using the physical buttons.
  - **While the MMU is idle**; (indicated by ALL LED lights OFF)
  - **The middle button** starts or aborts the filament loading to MMU.
  - The **side buttons** move the selector left and right to switch filament positions.
- Use the side buttons to move the selector onto the desired filament position indicated by the selector being aligned with one of the lines on the label-plate.
- The ongoing **loading** process is indicated by a **blinking green LED** light for the respective filament position.
  - **Stable green LED** light means the given filament is loaded to extruder.

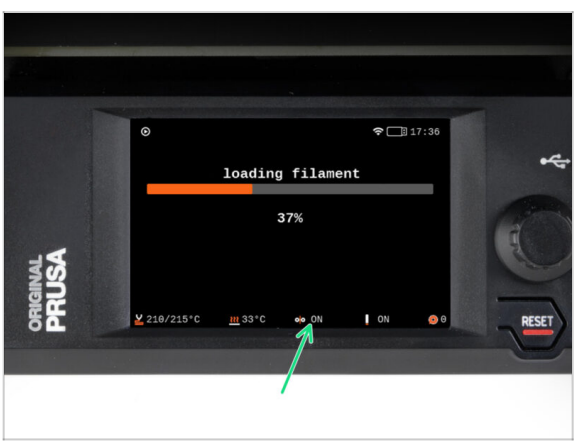
Note, after you issue a command to the MMU unit, wait and let it finish the operation. Don't rush. Don't play around with the printer in the meanwhile. **Let it finish first if the MMU unit does something (homing, loading, unloading).**

STEP 7 Loading test (part 1)



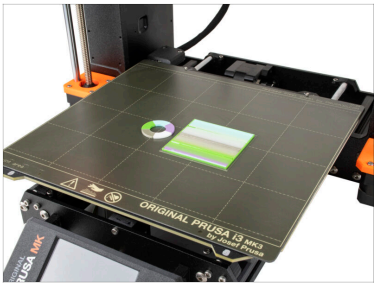
- Go to the **Control > Loading test**
- **Test all the filaments from 1 to 5 manually**, if "Test All" item is unavailable on your firmware version.
- The MMU unit will now load and then unload all five filaments to see if all work correctly.

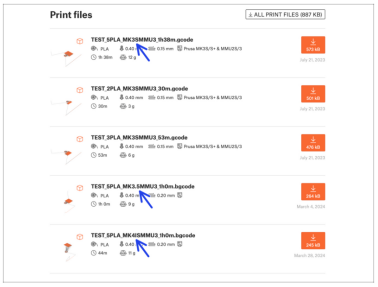
STEP 8 Loading test (part 2)



- On the **MK4S** printer, you can check the filament sensor's status in the "footer" area of the LCD screen to see if it's detecting the filament correctly.

STEP 9 Printing a test object

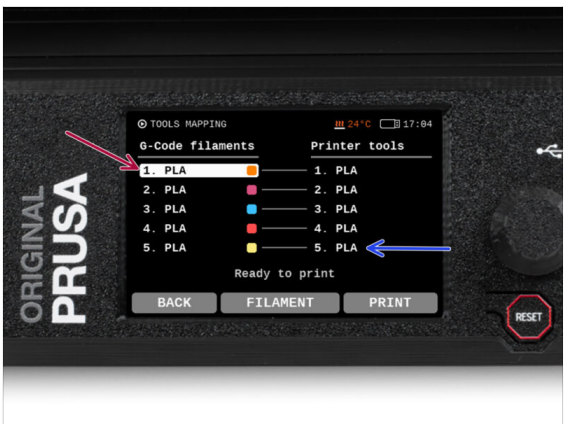




ⓘ We need to print a test object to verify that everything works correctly. Don't worry, it will be a quick print.

- Visit MMU3 Test objects on Printables.com
  - In the Print files section, download a G-code file pre-sliced for your **printer model**.
  - Save the **.gcode** or **.bgcode** file onto a storage media and print the test object.

STEP 10 Tools Mapping



- **Tools Mapping screen** on MK4S allows you to reassign the extruders with the specified color to another one as needed.
  - On the left side, you'll see a list of the required materials and their colors, as specified in the G-code file.
  - On the right side, you'll find a list of materials currently available on the printer, that will be used to print the object.

For example, if the G-code requires orange filament in the first position, but you have orange loaded in the fifth position, select the first position on the left menu and then assign it to the fifth position on the right.

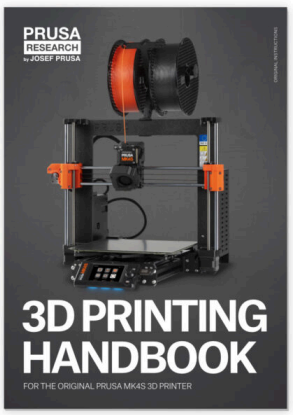
ⓘ Double-tap the filament positions or use the encoder to select the filament number.

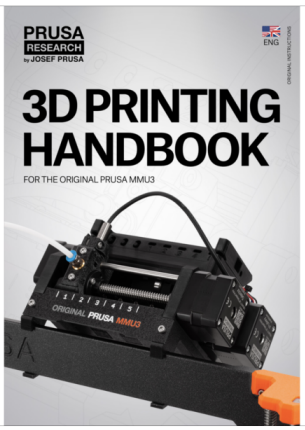
STEP 11 Printable 3D models

- To further test your new MMU3, have a look at MMU3 Test Objects Collection on Printables.

  We recommend printing the cute sheep, which has been the MMU mascot since the beginning.

STEP 12 Print & Follow the Handbook





Please read the 3D Printing Handbook dedicated to your printer and follow the instructions to set up and use the printer properly. The latest version is always available at help.prusa3d.com.

⚠ Read the Disclaimer and Safety instructions chapters.

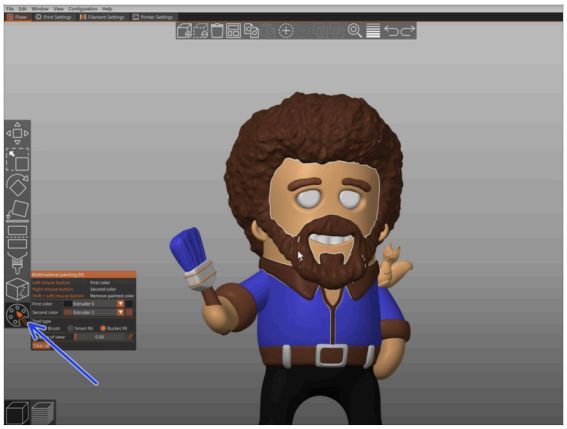
- Start the print and wait until it finishes. In the meantime you can take a look at the **printed Handbook**.

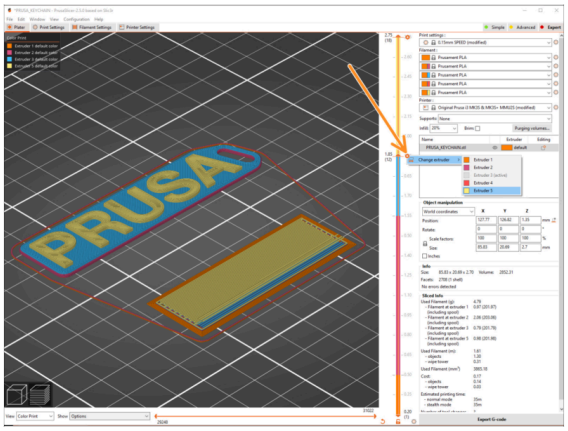
All the information regarding calibration, how to organise the printer, buffer, spools, or troubleshooting tips are all in the printed or online **3D Printing Handbook** for **MMU3**.

To download the **Handbook** or if you encounter any issues, please visit our knowledge base at: http://help.prusa3d.com/en/tag/mmu3/

- If you are having any issues while printing, follow the on-screen instructions or visit the link from the LCD screen.

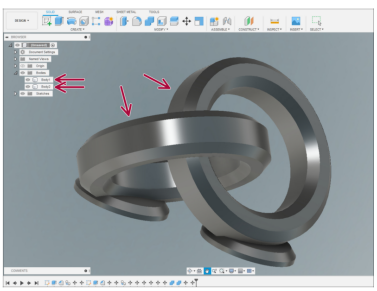
STEP 13 G-code preparation / Custom model preparation

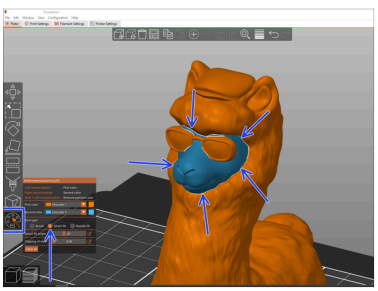


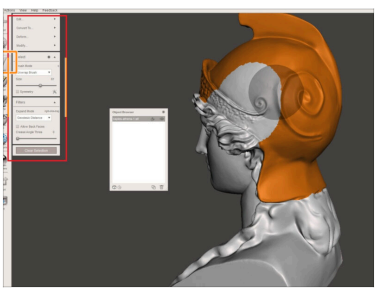


- Already printed all the bundled multi-material models from us as well as those seen at http://Printables.com? **Time to print your own designs!**
- The simpliest way of making a single-body object colorful is the MMU Painting function in PrusaSlicer.
- Basic steps for the manual method are described in our G-code preparation for multi material print section.
- For printing logos or text labels, you might also find the automatic color change at a given layer height useful. Simply, slice an object, select a certain layer height, click the small orange "+" icon next to the height marker and select the desired MMU filament position (Extruder number).

STEP 14 Making your own Multi-material models

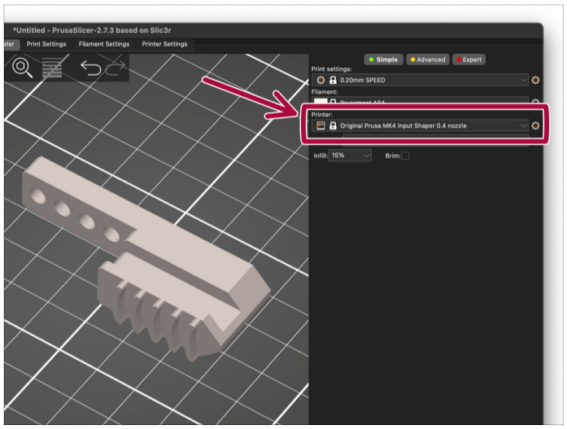


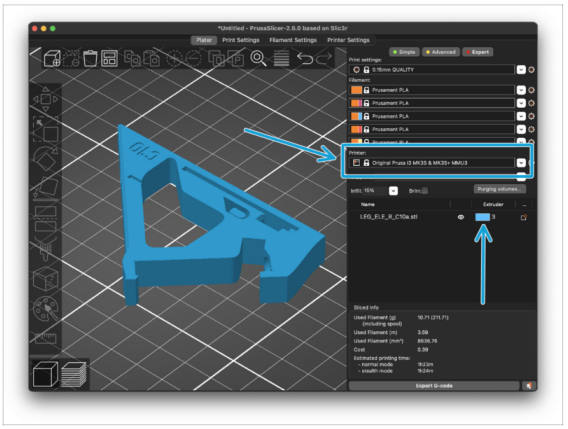




- If you have designed a model with multiple bodies, you may find the Exporting model from Fusion 360 guide useful.
- If you are designing a single-body model, part of which should be MMU-Painted, make sure there is a sharp line surrounding each distinct part so that you can use the **MMU Painting**'s **Smart-fill** function later on in **PrusaSlicer**.
- If you have an intricate STL file that can't be MMU-Painted easily, you can try the more sophisticated way of Splitting STL with single compact part or Splitting STL into multiple parts using MeshMixer.

STEP 15 MMU Single material operation





Did you know that MMU3 unit can also be used to make **single-material printing** more convenient too?

- You can keep up to five of your favorite materials loaded into the MMU unit.
  - Use the regular **MK4S profile**, when slicing. The printer will allow you to choose which filament to use, once you start printing.
  - If you know which of the five materials to use already while slicing, you can use the **MMU3 profile** and assign a single color (Extruder number) to the object.
- If one of the filaments runs out, your print might be able to continue automatically with the Spooljoin function.
  Check the SpoolJoin article for more info.

Notes:

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