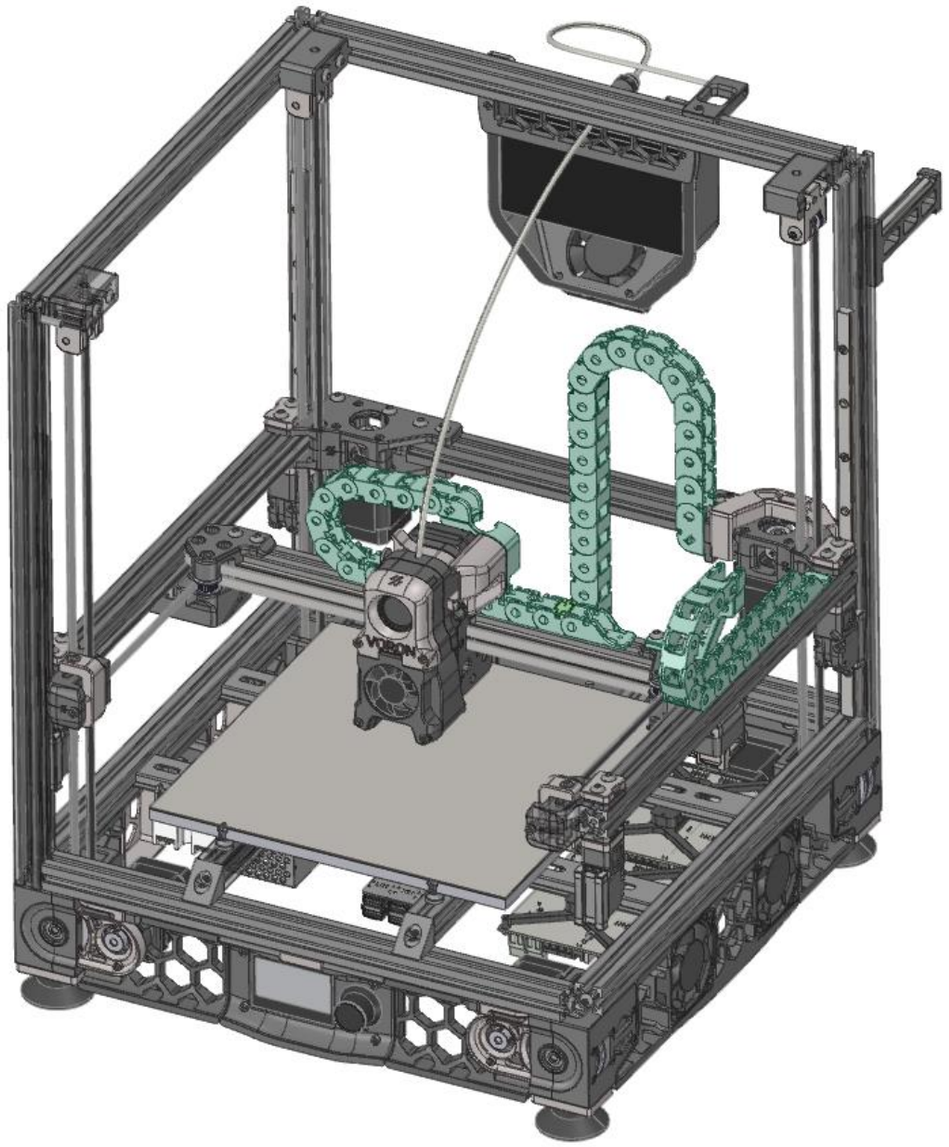
PanzerChain 2.4
for VORON 2.4



Assembly Manual
Version 2021.10.25

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Introduction

I find black chains boring and I coulnd´t find visually appealing printably chains that follow the spirit of Voron.

That´s why I spent kilograms of filament and days of work to develop PanzerChain:

In 2019 the initial PanzerChain was born which was based on the well known igus design. This first release was liked by quite a lot people of the community due to it´s design and functionality.

Even though this first iteration still works very well on my first Voron 2.2 i felt the need to improve it for 2.4 and my second Voron.

I am therefore particularly pleased to present PanzerChain 2.4

Enjoy!

What it is and what it is not!

- It is :
  - A custom energy chain for x/y and z axis meant to be used for Voron 2.4

- It is not:
  - An identical replacement for IGUS chain E2i.10.10.018 on XY-axis
  - ...nor for the E2.15.10.028 IGUS chain on Z-axis
  - A chain with separate compartments for wire organization
  - Perfect (for example it needs a little wear in time)
  - Compatible with any other chain

When to use?

- You like to print your own stuff :-)
- You like accessible/openable links for easy maintenance
- You prefer accent colors (see folder 'themes' for ideas)
- You want to save some money (it´s not a lot! Go for Igus if in doubt or some alternative cheap Ali-stuff)
- You don´t want to wait for your order to arrive
- You don´t like tape chains (wire failure) or zip chains (fiddly)
- You don´t care about
    - Extreme noise reduction
    - A not perfect bending radius
    - Or any other shortcomings due to additive manufacturing / fdm

Improvements of this Reboot

- Even easier to print
- Less supports
- More room where chain hits xy-joints
    - Probably some z-height loss
- Larger bending radius (ideal for heluflon wires)
- Clips are easier open without tools
- Removed unnecessary tolerance options
- New logo
- Nicer bending behavior (no s-curve/sagging but nearly pure u-curve)
- Revision Numbering from now on as VORON V2

Printing

- do a test print of 3-4 xy-links
- check for layer adhesion
    - print slower and/or with higher temp if necessary
- filament: esun abs+
    - feel free to experiment, but don´t blame me!
    - (petg seems to be okay or even superior based on user feedback)
- 0.2mm layer height incl. first layer
- no supports: required supports are already incorporated and easy to remove
- check your slicer preview: all walls need to be filled as much as possible
- tested at roughly 40mm/s - 60mm/s print speed (inner and outer shells)
    - if in doubt: go slower 25-30mm/s should work fine!
- at least 2 links per print for cooling time or slower speed
- Pressure Advance should be calibrated to allow for smoother kinematics
(for example refer to Klipper Documentation)

Required Links

- As a rough estimate you need this amount of links (+spares)

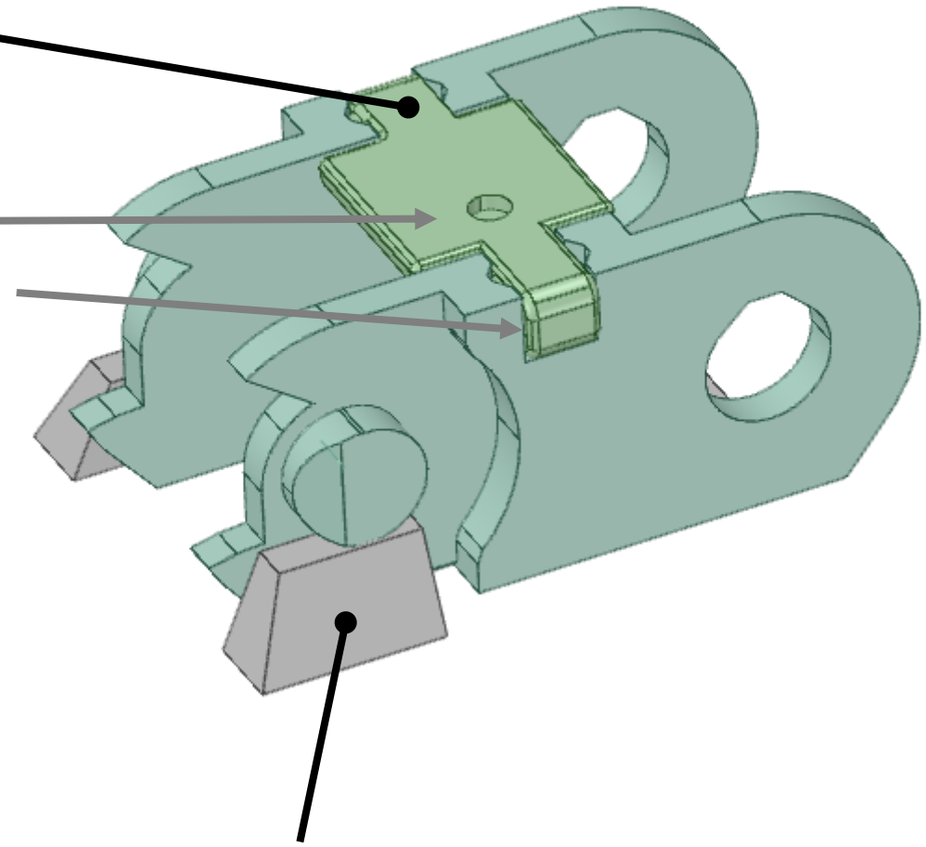
- 250
  - X 17 Links
  - Y 17 Links
  - Z 22 Links (in when not using solid extrusion)
- 300
  - X 20 Links
  - Y 20 Links
  - Z 25 Links (in when not using solid extrusion)
- 350
  - X 23 Links
  - Y 23 Links
  - Z 28 Links (in when not using solid extrusion)

Links

xy-link.stl / z_link.stl

xyz_clip.stl

- open while joining links
- 'Easy Open'
  - o-marker
  - extended latch

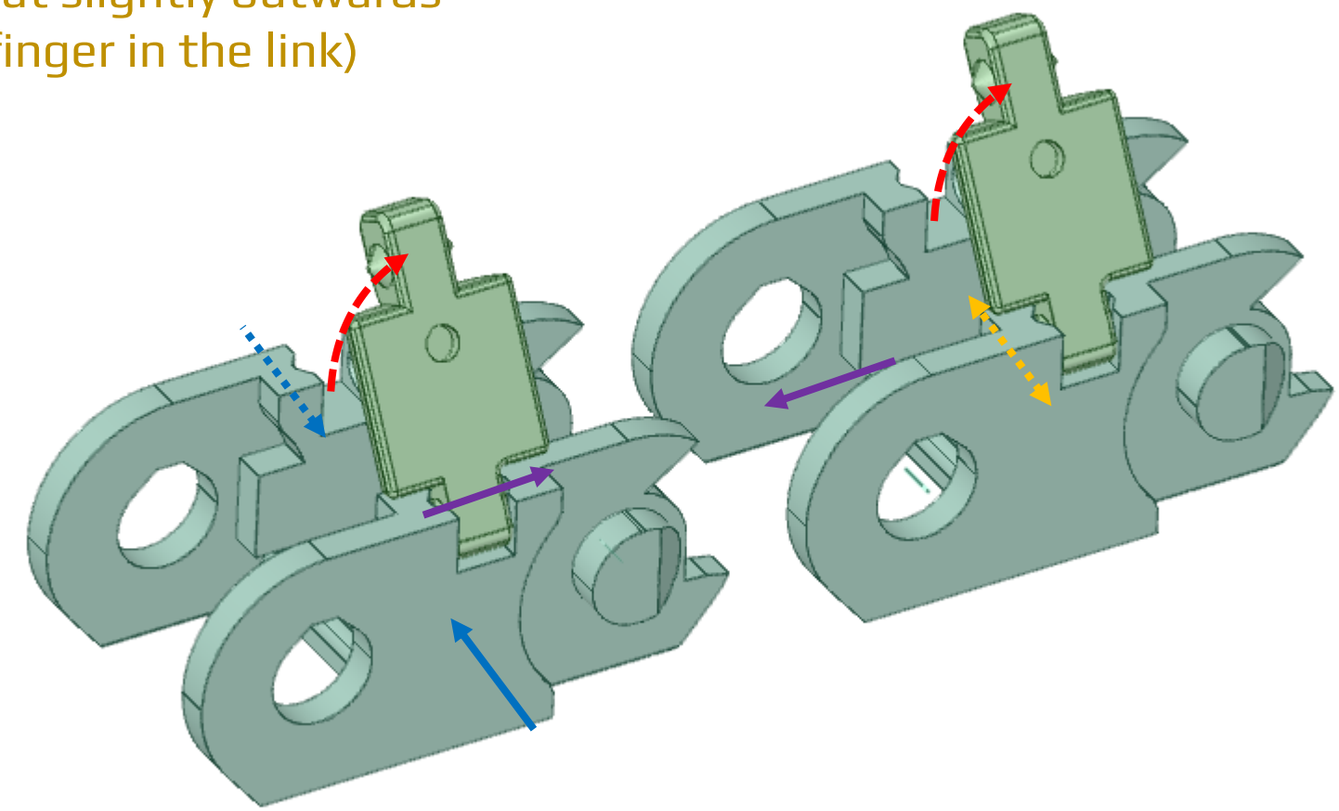


Supports

- need to be removed

Assembly of Links

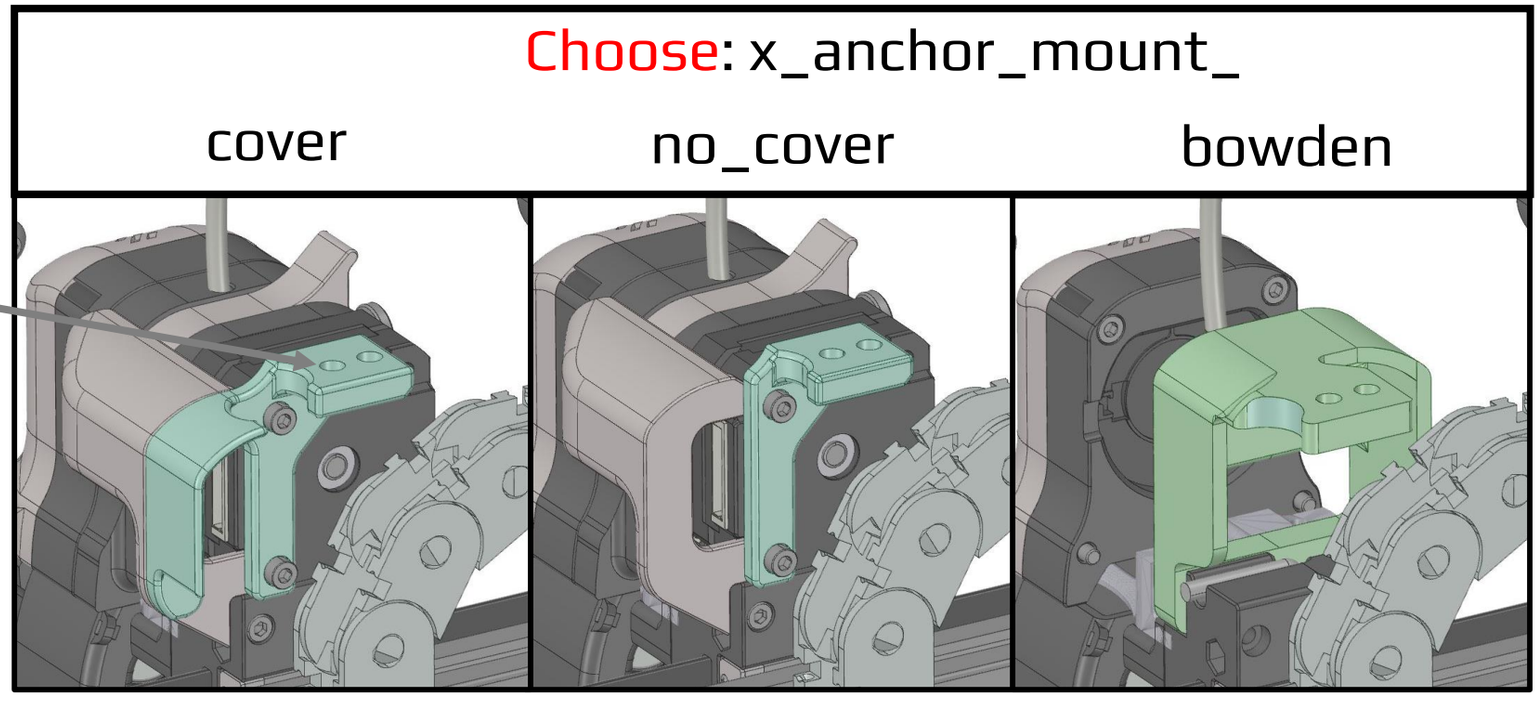
1) Open clips
2) Push inwards
3) Push out slightly outwards
   (put a finger in the link)
4) Join



X-Chain

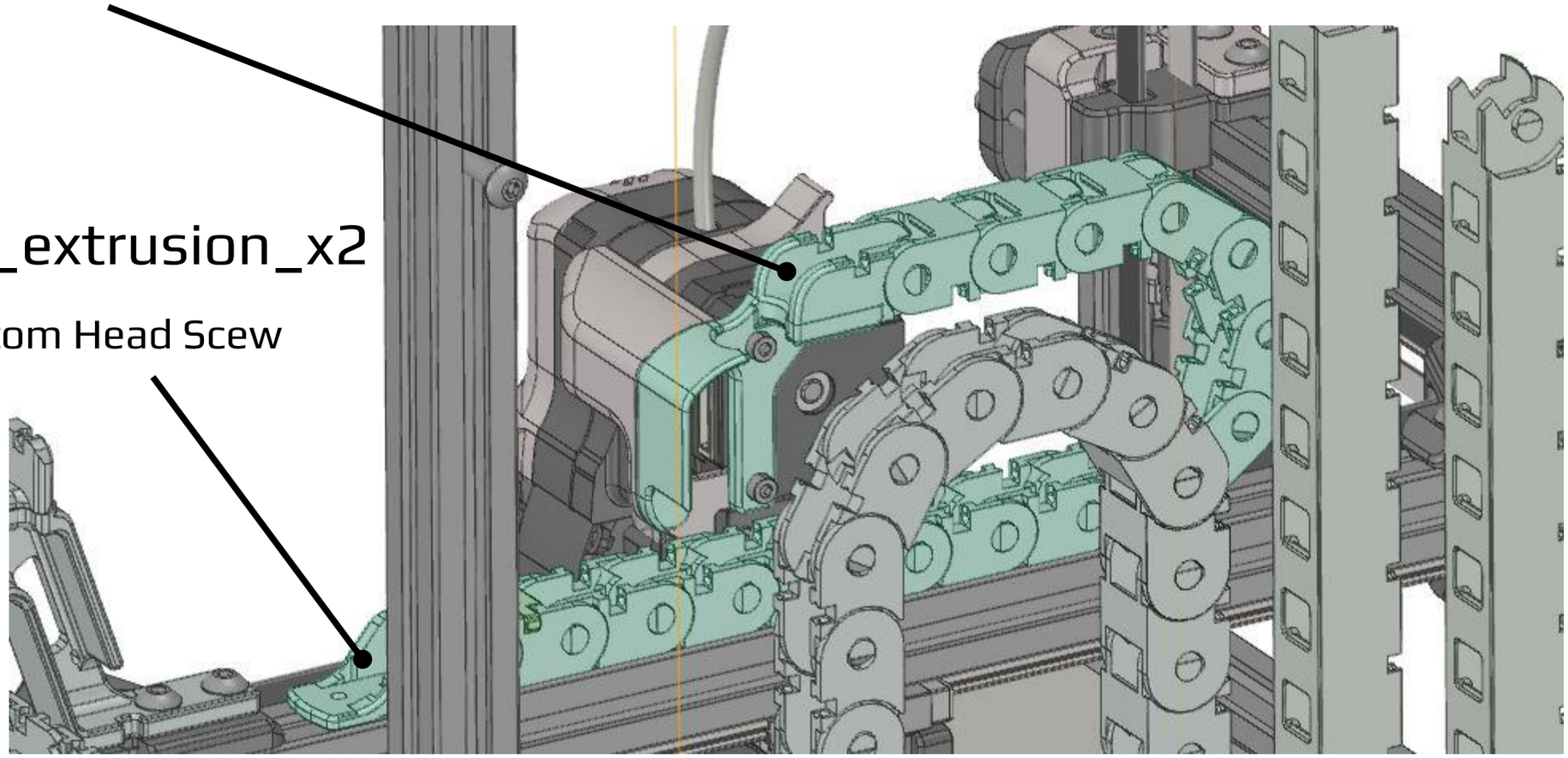
2x M3 heat inserts

x_anchor_direct_drive_x1.stl

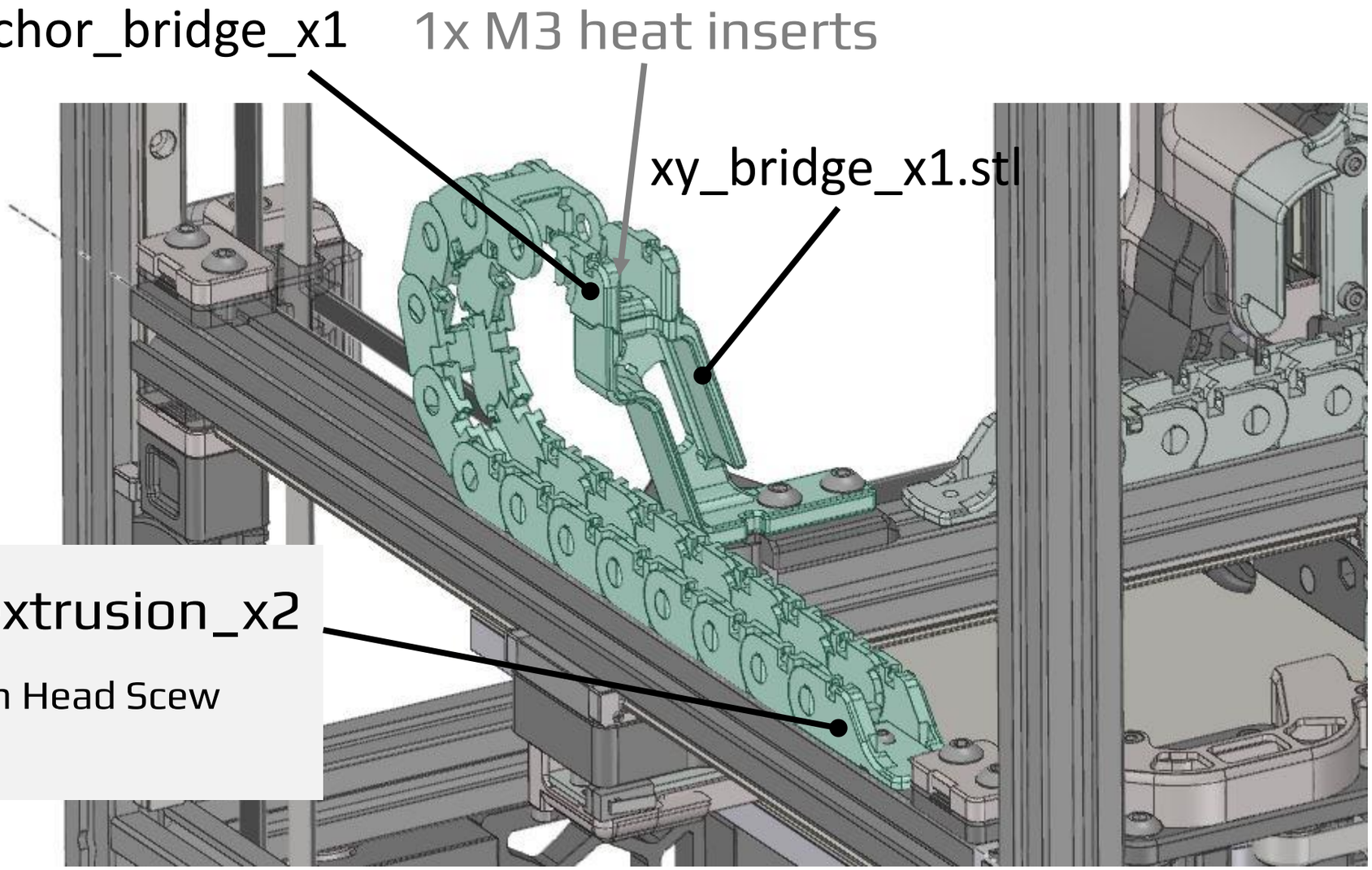


xy_anchor_extrusion_x2

- 2x M3 Bottom Head Scew
- Zip Ties



Y-Chain



- 2x M3 Bottom Head Scew
- Zip Ties

Z-Chain

z_anchor_gantry_x1.stl

- 2x M3x8 Bottom Head Scew

z_anchor_frame_x1.stl

- 2x M3x8 Bottom Head Scew