

Belt Path



One of the most important parts for corexy motor movement is the belt path. Here's a guide to the mechanics of corexy belt path and pattern layout in order to get accuracy and constant belt tension.

There are two main ways to implement the belt path for the corexy kinematics. Either a stacked pulley arrangement or a crossed belt also known as a belt twist. The crossed belts design allows for each belt to take different paths, creating an x-shape configuration. The stacked belt path simplifies alignment and belt tensioning.

Belt Routing

There is an increased complexity in this routing due to having two different height motor shafts, but it also eliminates belt tensioning issues. 3D printer resolution may be affected when the toothed belt runs on a smooth idler as it results in a curtain effect pattern also known as ripple.

Crossing Belts vs Stacked Belts

Many people prefer the stacked belts approach. Twisting the belts can cause the belt to ride on the flanges of the pulleys which causes wear on the belts. However, there are many corexy designs that work very well with this mechanical arrangement. The main concern is that belt tension varies from one height level to another because it has different lengths created by varying tensions depending on how tight they are wound around their respective pulleys .

Crossed Belts

The Railcore design had a lot of influence on the SolidCore 3D Printer. The belt path of both machines cross in an “x” shape, but many people prefer the stacked belts approach. Twisting the belts can cause the belt to ride on the flanges of the pulleys which causes wear on the belts. However, there are many corexy designs that work very well with this mechanical arrangement. The main concern is that belt tension varies from one height level to another because it has different lengths created by varying tensions depending on how tight they are wound around their respective pulleys .

Idler Pulley Setup

While both belt routing methods can be equally effective if implemented correctly. But belt path designs that move the belt teeth against smooth idlers, and designs that run teeth against the teeth of the idlers.

Belt Path Troubleshooting

It is possible that the toothed pulleys produce more noise and some people claim that the teeth against the smooth pulley causes irregular offsets in their printing from belt stretching but a smooth belt surface on a smooth pulley reduces ripples and may be a simple way to increase the print quality, as it would allow for more of an even printing process. This belt path setup can cause artifacts within printed parts. This belt path allows for a straight belt path without any twists which may increase print quality.

Belt Tension

The Solidcore corexy belt path must be parallel to the linear guides as the carriage moves along an axis. This means that there is a x-shape configuration with two points of contact at both

ends. The length of the belt may vary in tension. Belt tension may increase or decrease as it moves along the axis. The length of the twisted segment must maintain constant tension, otherwise the twist will cause the belt tension to vary.

Belt Path Layout

Offsetting the stepper motors with stacked belt path pulleys may give the belts a clean run and simplify belt alignment. A printer's motors can be offset at different heights so that the belt routing runs a straight belt path and doesn't have to be twisted. But this belt routing path would also mean that on one side of the gantry the belt would have the teeth on the side of the idler wheel which wouldn't run as smooth and could lead to artifacts within printed parts.

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