

Have you ever had trouble with the design of your lift or base? Is it too bulky, heavy, and space-wasting? My team has seen many robots struggle with a lift or base that weighs too much, including us.

The 1x25 c-channel, a part I created in Autodesk Inventor, will help solve this problem. This item is lighter than a standard 2x25 c-channel, but sturdier than a steel bar, giving you the best of both worlds. The c-channel is designed exactly like the 2x25, with the 2 ridges on the sides to prevent bending. Because the 1x25 c-channel weighs approximately 25% less than its 2x25 counterpart, the part you are building will be lighter and faster.

This part could be used in making lighter lift systems (example shown in pictures). Especially in this year's competition, lifts do not need to be excessively heavy to lift an object that is  $\frac{1}{4}$  of a pound. This c-channel would make the lift weigh less and be more compact.

I used Autodesk Inventor Professional 2018 to design the c-channel. First, I cut a 2x25 c-channel on the middle of an edge hole. I then made the part I cut into a part, and placed 2 copies of the part into a new assembly. Next, I mated the two parts together and flushed the holes so they were aligned.

After designing the part for this challenge, I have learned how to edit parts to make them more efficient. I gained a wider knowledge of the uses of the functions in Autodesk Inventor. This year, my team and I have used Autodesk to design parts we are going to build, such as a lift. We also use Autodesk to keep track of designs we have had in the past, as they are stored in the computer, not wasting parts.

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The skills that I learned during this experience will be useful in my career, as I aspire to become a structural engineer. The stress analysis and environments aspect of Autodesk will definitely be useful in the everyday work of a structural engineer. As the workforce becomes more and more competitive, having this knowledge will definitely be a valuable asset.