

KEYCREATOR®

Tips & Tricks



ZVOL12

Tips & Tricks #77 Creating Wing Core Partitions

Several years ago I introduced users to a neat way to quickly create multiple core partitions for built up structures like composite wings.

Several customers have asked how to do this recently and unfortunately the original exercise appears to have been lost along the way.



So in the spirit of the holiday season I'm happy to provide you with a quick review of how to easily create multiple core partitions using a powerful feature that showcases a real strength of direct geometry modeling in KeyCreator.

The goal is to quickly produce a set of core partitions shown in the illustration above that form a framework for buildup of a wing.



The file "WingCore1" is available for download to use in this exercise.

Typically, a user develops a final wing shape first and works backward to a core shape that allows for buildup of several layers of composite material.

In this example we have allowed for 0.1 thickness buildup from the inner core to the final wing shape.

Creating the set of wing core partitions (Think of them like the inner cross-section walls in a bamboo trunk.) is really simple if you use two powerful tools available in KeyCreator.

First, we'll remove level 5 (The final wing shape) from the display leaving the core and the blue rectangle.

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Next, extrude the blue rectangle downward a distance of 5 inches. (We just want it to extend past the bottom of the largest wing profile.)



Your screen should now look like this:



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Now so far, we haven't done anything exotic. Our next two steps, however, are the "icing on the cake!"

We can then use the XFORM DELTA COPY function to make 13 copies of the block (Y distance of -2 inches.)





Solid/Surface

Create

Modify

Tools

Click on the BOOLEAN COMBINE Function and select all of the blue blocks on the screen. Then, click on Accept.

(You'll get an advisory message shown below. Click on Yes.)



Now, click on the BOOLEAN INTERSECTION Icon. Select the wing core and the set of blocks (They now behave like one solid.) and click on Accept.

You will now have each core partition shaped to the exact crosssection at its location.

x

Since the partitions will still act like one solid, you have one more thing to do!





Click on the SEPARATE Icon and then on the set of core partitions. This will split them back up into separate solids!



Your finished partitions with overlaying skin (Level 5-Shown as a transparent solid) should look like this:

Remember this powerful capability provided by KeyCreator direct geometry modeling whenever you have to create core partitions for a built up structure.

I've used a lofted wing structure here but you could just as easily use this for any situation where interior partitions in a design are bounded by the inner walls of a containment solid.

Note: With a slight modification to add draft this is a really quick way to create reinforcing cross ribs in a molded plastic part with complex outer shape.