



USER MANUAL  
for creating INSERTS

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## Introduction

Thanks for purchasing KIT OPS PRO for **Blender 2.79**. KIT OPS is a product of years of experience in both programming for Blender and building Blender products, combined with award-winning interface and concept/industrial designers working to create the ultimate in kitbashing toolsets.

We're very proud of this product and we hope you will have hours of enjoyment and productivity using it.

If you haven't yet, please read the [KIT OPS Manual](#) first before going forward. There you will find the necessary information on how to install and use KIT OPS when not in FACTORY mode.

## Overall Purpose of KIT OPS FACTORY



*This is one INSERT in KIT OPS*

The KIT OPS PRO addon is different from the KIT OPS FREE addon. One of the differences is PRO provides authoring of the KIT OPS INSERTS. We call this FACTORY mode. You can create your

own INSERTS and place them in existing or new KPACKs. You are free to do whatever you want with your own KPACKs and INSERTS– give them away or sell them or just use them for your own designs.


Remember, a KPACK is just a folder which contains special .blend files, called INSERTS, which KIT OPS understands how to use in a scene.

Also, FACTORY can automatically create single thumbnails or batch process a whole KPACK of INSERTS to create all new thumbnails.

## How does FACTORY mode work?

It's helpful to understand an overview of the basic workflow. Then we can get into specifics.

1. Open an existing INSERT and **Save As...** to create a copy of it using the new name you would like. Be sure and save to an existing KPACK folder.
2. Create your *cutter* object and add to it any solid faced objects.
3. Set the properties of the *cutter* object to **Main object, Boolean (Difference)** and **Auto parent**.
4. Press the **Render thumbnail** button.

And that's pretty much all there is to it! You can go to the user prefs, select KIT OPS > File Paths tab, and press the refresh button  to rescan all the KPACK folders, which will find your new INSERT.

You may find it's easier to build your INSERT in another file, and test it there using modifiers, etc., to make sure it works, and then copy/paste it to your INSERT file.

## How to Create an INSERT: Step by Step

Let's walk together through the steps in detail to create a KIT OPS compatible INSERT file.

## Step 1: Starting with a new *clean* INSERT file

It's best to start by opening an existing INSERT (.blend) file from any folder designated as a KPACK folder. For an understanding of the definition of KPACK, please review KPACK folders in the KIT OPS documentation.

NOTE: When you first open *any* file in Blender, KIT OPS checks to see if the file resides in one of your designated KPACK folders. If true, then KIT OPS automatically goes into FACTORY mode where you can edit and create new INSERTS.

Once open, you'll notice the KIT OPS Tool Shelf tab has a different look and ***there should be a 1 pixel red rectangle around your viewport. This lets you know that you are in FACTORY mode.***

TIP: You may want to open up a second instance of Blender to work with your INSERT and a scene file where you can test it. To do this, click the middle-mouse button on the Blender icon in your Windows 10 taskbar. Mac users may want to look here: <https://www.cultofmac.com/200062/run-multiple-copies-of-an-app-at-once-on-your-mac-os-x-tips/>  
Linux users will need to review best practices based on the flavor of Linux they are using.

Next, **File > Save As...** and give your new INSERT a new and descriptive name. Be sure and save it to an existing KPACK folder so that you remain in FACTORY mode. Next, select everything in the file and **X-Delete** it all. You can save again and you now have a blank INSERT scene file from which you can work.

***The reason we start with an existing INSERT file instead of a new file, is to make sure there are no 'other' objects like cameras, lights or any of the unique startup scene objects which may get in the way of INSERTING at a later time.***

TIP: If you like you can also keep cameras, lights and other parts in any Layer other than 1. This may help in testing. KIT OPS only looks at Layer 1 when importing an INSERT file. It would probably be good practice to delete the contents of the other layers before saving your INSERT, but it is not necessary.

## Step 2: Building your INSERT

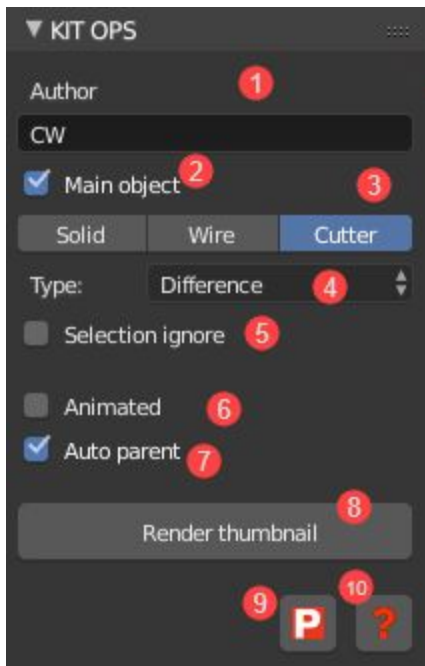
When starting to build INSERTS, there are a number of things you'll need to keep in mind.

- All INSERT geometry must reside in Layer 1
- You need to designate one object as the **Main Object**. All other objects are typically child objects. If you do not designate a Main Object, one will be automatically selected for you. This may result in non-optimal behavior, so be sure and set a Main Object.
- The insertion point of the overall INSERT is the Origin point of the Main Object.
- You can designate any object **Boolean** and assign the **Type: Difference, Union, Intersect**. When used as an INSERT on an **Active Object**, the Boolean designated objects will be added as the respective Boolean modifier in the Active Objects modifier stack.
- Any objects not designated Boolean, will also be attached to the INSERT and shown *unless* they have their property set to **Draw wire**.
- It's a good idea to try and keep your INSERT within a 2x2 unit grid in Blender (top view). This way the Thumbnails will render correctly. Occasionally, this may not be possible, especially if you're creating accurately scaled architectural INSERTS. In those cases, please see [Thumbnail not cropped right?](#)

## KIT OPS FACTORY panel

When you select any object in Blender, KIT OPS will populate the KIT OPS Tool Shelf with it's current property settings as shown below.

To the right is the description for each property.



1. Author name or initials property. This is part of the INSERT properties.
2. Main object property. True if the selected object is the parent object of the INSERT
3. Status property setting of the object.
  - a. Solid: renders as a solid and displays as a solid object.
  - b. Wire: renders as nothing and displays as a wire object.
  - c. Cutter: renders as nothing and displays as a wire object.
4. Boolean Type property. The type of Boolean modifier created if the property is set as Cutter. Select either Difference, Union or Intersect. (Note: Cutter objects can also be added if you select Union!)
5. Selection Ignore property: Object will be ignored when INSERT is selected. Default is OFF. This is used only for upcoming SMART features for products.
6. Animated property. Tells KIT OPS that there is an animation included in the INSERT.
7. Auto parent property. Automatically parents all objects to the Main object. This should be left on, except in rare instances– such as using hooks to dynamically manipulate the INSERT.
8. Render thumbnail. Press it once to render a thumbnail image of the current INSERT .blend file. It will be stored as a 256x256 PNG with the same name as the .blend file.


## First time INSERT builders

It's probably wise to start your first INSERT in a new file, complete with camera and lighting so you can render it and check it to see how it works. This is especially true if using Boolean Difference properties as they can get tricky to conceptualize.

Start by building a cube then create the object(s) you want to cut into it. Apply Boolean Difference modifiers to the cube. Add any other solid parts and then test render. Once you have it working, you can copy and paste the specific objects to your blank INSERT file, then save it from there.

## Step 3: Testing your INSERT

Once you have your INSERT set up correctly, you can save it, and then refresh the KPACK using User Prefs (or restart Blender) to make your insert available. If you are saving over an existing insert, no KPACK refresh is necessary.

To refresh KPACKS: You can go to the user prefs, select KIT OPS > File Paths tab, and press the refresh button  to rescan all the KPACK folders, which will now make available any new INSERTS added.

## Step 4: Creating Thumbnails

One of the great features of PRO, is the ability to auto-generate thumbnails. And even better, it can do it for an entire KPACK of INSERT files!

Here's how it works. Assuming your INSERT is within the 2x2 unit grid in Blender, it's easy. Just press the **Render Thumbnail** button.

If you want to change some settings, for instance default materials, then you can **CTRL+Render thumbnail** button to load the render scene. From here, you can change default properties and other as you wish. *At this time we do not support debugging custom thumbnail scenes you may wish to try.*

Pressing **Alt+Render thumbnail** will begin a batch render and create thumbnails for all the INSERT files in the same folder as the INSERT you currently have loaded. This will **lock up Blender** until it is complete. If you want to show the status, you can open the Console (Window > Toggle System Console) and see information on which .blend file is currently rendering.





### *Thumbnail not cropped right?*

We typically try and create our INSERT within a 2x2 unit grid. This is where the camera is targeted. We are looking at creating a better autoscale of the camera frame, but for now, it's a good idea to **save your INSERT**, then resize your INSERT to that grid size **before** pressing the **Render thumbnail** button. Afterward, select **FILE > REVERT** to go back to your original sized .blend scene file. **Do not save your insert after it has been scaled!**