

Title:

BOTTOM UP COMPONENT / ASSEMBLY CREATION AND USAGE

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1 Purpose

This document will outline the process of creating Bottom-up Assembly/Component models.

2 Overview

Bottom-up design is the traditional method for modeling. In bottom-up design, you create components, insert them into an assembly, and mate them as required by your design. Bottom-up design is the preferred technique when you are using previously constructed, off-the-shelf parts. An advantage of bottom-up design is that it allows you to focus on the individual component. It is a good method to use if you do not need to create references that control the size or shape of parts with respect to each other.

3 Bottom up Modeling

Bottom-up modeling practices will be used primarily for the creation of standard component installs and purchased components.

3.1 Bottom up Model Creation

Like purchased component models there are a few things to consider before starting:

- Is there an existing model?
- Can an existing model be used?
- Where will it be used?
- How will it be used?
- How will it be mated?
- How much detail will it require?
- Can mate references be used?
- Is a data spec available?
- Are any images available?

3.1.1.1 Design tables and multiple configurations

If multiple configurations are required then consider if a design table would be in order. Design tables can easily create multiple configurations of the same base part and requires little time for later modifications. Otherwise, don't be afraid to save one file for each part number. A reload command can quickly replace components that were constructed from *save as...*

3.1.1.2 Mates and Planes

Before starting a model, consider how the component will be mated in the parent model. The component origin and plane position will aide in mating of that component within the parent model. Planes should be available for standard mating surfaces, in lieu of faces. This can encourage consistent mating methods between similar component types regardless of shape. Use the same primary planes (names and sequence) for a family of standard installation. This allows components to be replaced while retaining mates and orientation

3.1.1.3 Level of detail

When creating bottom-up models it is necessary to decide the level of detail the model requires. Critical interfaces such as mounting hole locations and sizes would be shown,

while component features not relevant to the installation of the component (i.e. Screw threads, data tags) would be omitted, this is essential for keeping file sizes down.

3.1.1.4 File Properties

Refer to the *<File Properties Document>* for instruction on assigning properties to the model. This document should be referenced to assign the standard properties used in the SolidWorks BOM.

3.1.1.5 Library features

There are times that an external source can specify a standard production method that could be utilized as a library feature. An example would be a standard plumbing end that is defined by a MIL or NAS specification. The same file names and construction methods that are utilized by a solid component should be used in a library feature.

Standard cutouts for purchased components and standard installations can be another great way to utilize a library feature. Unless this cutout is defined by an outside entity, though, an installation drawing should be created and the library feature saved there. Planes in the library feature should match the planes in the component of standard installations

4 File Name and Storage

Please refer to *<File Naming Document>* for standard file names and locations.