MFG462342 – Inventor Nesting Isn’t Just for Sheet Metal

Mark Lancaster
Application Consultant – Data Management – Synergis EDS
Our Agenda

• WELCOME AND INTRODUCTION

• DISCOVER INVENTOR TESTING
  • Learning Objective #1

• LEARN HOW TO EXTRACT AND USE NON-SHEET-METAL COMPONENTS FOR NESTING
  • Learning Objective #2

• LEARN HOW TO USE AUTOCAD DRAWINGS, DXFS OR OTHER FILE FORMATS IN YOUR NESTING
  • Learning Objective #3

• LEARN ABOUT THE SAW CUT METHOD (BONUS ROUND)
  • Learning Objective #4
Welcome

Hello everyone and welcome to my Autodesk University 2020 virtual recorded session on Autodesk Inventor Nesting [Isn’t Just for Sheet Metal]

Although I’ve done numerous live and recorded webinars over my career, presenting virtual for Autodesk University this year still doesn’t seem right since I’ve been presenting “live” at AU for 4 years now. Each year I look forward to AU and meeting new individuals and discussing Autodesk products and workflows with others.

And who can’t forget those after parties or getting invited to as many parties as possible.

If this is your first year at Autodesk University, I wanted to extend a special welcome to you and may you have a great virtual Autodesk University 2020 Experience. Perhaps one day when the entire world returns to normal, we will meet at a future Autodesk University Event.
About the speaker

Mark Lancaster/Synergis Engineering Design Solutions

I’m a self-taught AutoCAD user, starting out with release 9. I’ve been using Inventor and Vault since the 2008 release. My CAD career started out in the mid-80s while in college, but my first drafting job was still based on 80% board drafting and 20% CAD. Although I was a CAD draftsperson for a few years, most of my experience has been centered around the CAD management and Vault administrator role. I’ve had over 20 years’ experience in the manufacturing world and 15 years’ experience with 3D modeling. In 2013, I became an MFG Product Support Specialist/Help Desk Tech for an Autodesk Reseller (Synergis EDS) located in Quakertown PA. Currently I’m an Application Consultant for Data Management, providing Vault upgrades, support, training, data migration, and CoolOrange scripting/automation for our customers. I’m part of the Autodesk Expert Elite group and my first Autodesk University experience was in 2016. Since AU 2016, I’ve hosted and/or was co-speaker of eight (8) AU sessions.
Sit back and enjoy…

Today, our time is limited so make sure to also review the related session handout which provides more in-depth information about this session.
Learning Objective #1
Autodesk Inventor Nesting

THE MYTH

INVENTOR SHEET METAL

Yes Inventor nesting is geared toward Inventor sheet metal components, but it’s not just for sheet metal and that’s the reason why we’re here today.

NESTING

PLACING AN OBJECT

In a hierarchical arrangement, typically in a sub-ordinate position

PRODUCT DESIGN & MFG COLLECTION

NESTING

Imported in the 2019 release, it is a separate download through your Autodesk Account and must be installed as a separate add-on for Inventor.

WHO HAS ACCESS TO IT

IMPORT SOURCE FILES

Lays out your source files on designated raw sheet goods in an efficient way to reduce cost and scrap.
Autodesk Inventor Nesting

WHAT DOES IT DO?
Basically, Inventor nesting is taking your source files and laying them out on raw sheet goods in order to be cut out by your related manufacturing machines (i.e., router, laser, plasma, water). Although your process machine could be CNC related, keep in mind this is only processing a layout of your “2D” (outline) shape on the designated raw goods and additional CNC or other machining techniques is required to achieve the cutout and overall design.

NESTING STUDY
The study itself or the nesting file created is separate (.inest file format) from your Inventor model or AutoCAD documentation. However, just like an Inventor presentation file, there’s still a parent to child relationship that’s established.

EXPORT BACK TO INVENTOR CAM
The finished results can be exported back to the Inventor CAM interface as 2D or 3D or any other manufacturing/CNC software that supports DXF or nesting file format.
Autodesk Inventor Nesting

INVENTOR NEW
Select an Inventor Nesting template from the Inventor “New” dialog

INVENTOR HOME TAB
Either close all open models in Inventor or select the Inventor Home tab and select the “Nesting” ribbon tab/Nesting function

FROM THE MODEL
Right mouse click on the model in the Inventor (model) browser and select “Create Nest”
Learning Objective #2
Our first (2) two nesting studies will be based on a wooden drill press cabinet consisting of ¼” and ¾” plywood components.
Autodesk Inventor Nesting

Wooden Drill Press Cabinet

Nesting Study #1 Criteria

Determining the number of raw (sheet) goods!!!
Autodesk Inventor Nesting

DEMONSTRATION TIME

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Autodesk Inventor Nesting

Wooden Drill Press Cabinet

Nesting Study #2 Criteria

*Determining the actual nesting layout using 2-foot-wide x 8-foot-long plywood*
Autodesk Inventor Nesting

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Learning Objective #3
### Autodesk Inventor Nesting

#### 3D MODEL
- **IMPORTED INTO INVENTOR**
  - Source as Generic CAD
  - Material is generic
  - Thickness per model

#### DXF FILE FORMAT
- **AUTOCAD OR INVENTOR DXF**
  - 2D closed profile
  - Source as AutoCAD DXF file
  - Material is generic
  - .12 in thickness

#### DWG FILE FORMAT
- **AUTOCAD 2D DRAWINGS**
  - Model space only
  - 2D closed profile
  - Geometry only
  - Source as AutoCAD DWG file
  - Material is generic
  - .12 in thickness

#### INVENTOR FORMAT
- **INVENTOR PART (OR ASSEMBLY)**
  - Source as:
    - Sheet metal
    - Composites part
    - Inventor part
    - Generic CAD
  - Material for source
  - Thickness per model
Inventor Part

When the nesting source is set to Inventor Part, the first extrusion and its extrusion depth is used to determine the shape and material thickness for the nesting study.

Generic CAD

When the nesting source is set to Generic CAD, the largest planar face of the model is used and from there determines the thickness of the material perpendicular to that face.
Does it really matter?

Yes it does matter and in certain scenarios, Autodesk Inventor may have designated the source as an “Inventor Part” but it should’ve really been “Generic CAD” for your study.

Let’s roll the tape to see why?
AutoCAD Drawing

Is this downloaded AutoCAD drawing of a McMaster Carr part ready for nesting?

- Model space only [PASSED]
- 2D closed profile [FAILED]
- Geometry only [FAILED]
Autodesk Inventor Nesting
Learning Objective #4
Prior to the global pandemic, I was in the process of investing into the Maslow CNC project. This project is an open source with the goal of providing access to large CNC capabilities to anyone. Although the overall Maslow CNC project has nothing to do with this session, the foundation of this machine is solely based on a 2x4 studs/lumber frame. In this final learning objective I’m going to use Inventor Nesting as a optimize saw cutting utility and thus reduce cost and scrap when cutting bar (2x4 lumber) stock material.
The Cost

For the 2x4s that make up the Maslow CNC frame, the instructions indicate to purchase (6) six 2x4s that are 10ft long and (2) two 2x4s that are 8ft long. Based on the cost at my local hardware store it would roughly cost me $49 to obtain all of these 2x4s.

The layout

Is this visual aid the most efficient way? Did they plan it out or just wing it? Is there another way of combining different lengths of raw material to reduce the overall cost and scrap?
Autodesk Inventor Nesting
Autodesk Inventor Nesting

ISN’T JUST FOR SHEET METAL

Yes, we took Inventor Nesting and used it on non-sheet metal assembly. We also used it in a way that it wasn’t designed for

WRAPPING IT UP

In closing I hope the information provided clearly demonstrates Inventor nesting is not solely designed for Inventor sheet metal and you’ll be able to adapt its capabilities into your organization. Perhaps you will also discover new uses for it and share it with the community

THANK YOU

I just wanted to take this time to say thank you for signing up for this session and reviewing the provided information. Please take a moment to fill out your session surveys. Any feedback and comments are appreciated. Finally, I hope you will have a great virtual Autodesk University 2020 experience.