Introduction

A group of parts which have to be nested is commonly called Bill of Materials (BOM).

Each part in the bill of materials must have a drawing, which is generally read from a CAD file. Normally, each CAD file is supposed to contain the drawing of one part only. However, some CAD files may contain more than one part drawing. And some other CAD files may contain additional data, like a nested layout itself.

This document contains guidelines for reading data from such CAD files. The document also describes other methods of generating bill of materials. (Customized options for defining bill of materials have not been described in this document.)

Note

1) You do not have to create a CAD file for a standard shape. This is particularly true for Rectangle & Circle. You can type them easily in a an item-list file as well as bill of materials file.
2) Normally, the software treats MDF file as a CAD file. However, this document is not meant for MDF files. So, the guidelines meant for CAD files in this document may not work for MDF file.
3) In general, each CAD file must satisfy the following general conditions, in addition to the guidelines mentioned in the manuals.
   - Drawing must consist of 2-dimensional entities like lines, circular arcs, circles and closed polylines.
   - Each entity (line, arc) must be connected to both its neighbors at both the end points.
   - Contours in the drawing must not overlap or intersect themselves or other contours.
   - Each contour in the drawing must be a close profile.
   - Drawing must not contain any other data (eg. margin, dimension) that is not used for cutting.
   - In certain cases, the software may read text from a CAD file for performing some specific tasks.
   - Drawing must be in 1:1 scale, within a reasonable span.
   - Drawing must be prepared in mm (millimeter), not inch.
   - While reading data from a CAD file, make sure it is not already open elsewhere in another program.

Bill of Materials

## Case 1 – Import all part drawings from a single cad file
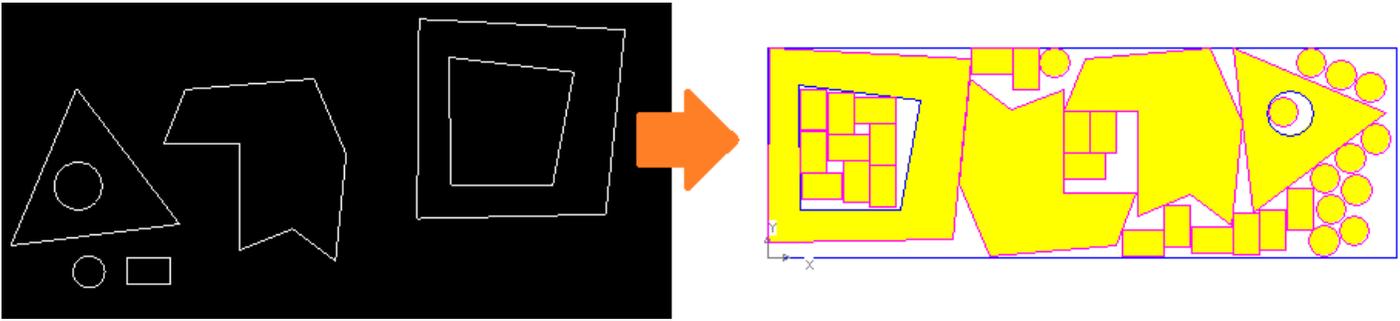
If the CAD file contains 2 or more drawings but does not contain any other data (like, quantity of each drawing or the size of the raw material sheet), do the following.

A) Enable the following options while creating a new job for nesting.
- a. Enable Custom selection.
  - i. Enable Layout.
- b. Do Material selection.
B) In the next step, select your CAD file.
C) Then, proceed as usual.
D) You will see a nested layout on your screen after some time, which you will be able to modify.

Note

1) It is desirable to keep all the drawings inside the CAD file within an area of 5,000 mm x 10,000 mm.
2) Note the following points while editing the nested layout obtained above.
- a. The software would not ask you to select the raw material size in the very first step. It is calculated automatically. However, if you do not like that, select the menu Edit > Stocklist to do the following.
  - i. Change the size of the automatically calculated sheet for the next auto-nesting process, by clicking the small button < -- > in the bottom-left corner.
- b. The first nested layout shown on your screen may look similar to the drawing saved in your original CAD file. That is because initially, the software adds the entire group of parts as a single part in your partlist. (You will be able to see the name of this part within brackets [-] in your partlist.) However, the software also adds each individual part one-by-one in your partlist. If you want to disable the group and handle each part individually, select the menu Edit > Shapelist to do the following.
  - i. First of all, click only on that part name which is written within brackets [-] in your partlist. Then, click on the button = from the left side to see the properties of this part. Now, remove the tick-mark against the option Selected. (In that case, the big group-part will not be nested during the next automatic nesting process. Do this if you do not like the current nested layout and want to nest the parts differently next time onwards.)
  - ii. Click on each part of your choice one-by-one and click on the button = from the left side. This will allow you to change the quantity of each selected part.
- c. Select the menu Layout > Layout++ > Reject all layouts to remove all the nested layouts.
- d. Select the menu Fit > Autonest++ > Re-nest to nest all the selected parts once again.

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## Case 2 – Import all part drawings & quantity of each part, from a single cad file
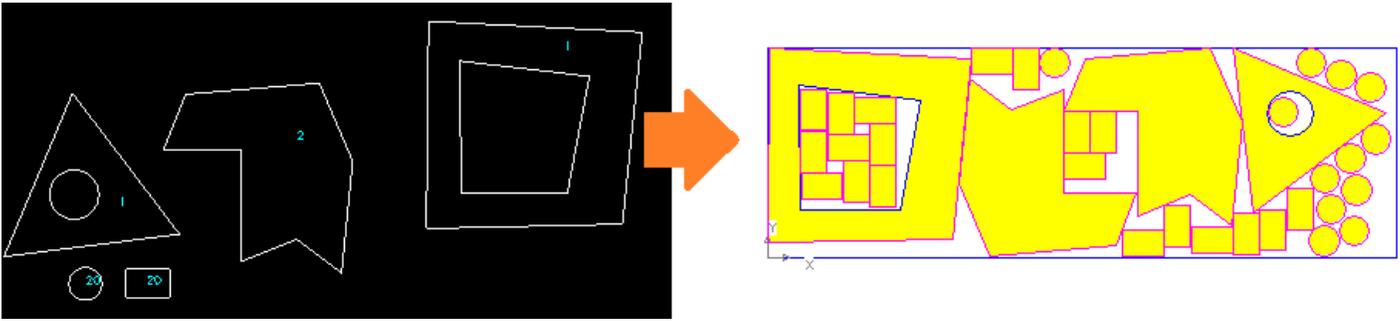
If the CAD file contains 2 or more drawings along with quantity of each within the part area (see the numbers in blue color), but does not contain any other data (like, nested sheet or other type of text data), do the following.

A) Delete the previous item-list file = C:\g0xin\00.txt. (Ignore, if item-list is absent or empty.)
B) Create a new item-list as follows.
    a. Start our drawing program = II-D and click on Convert dxf / plt files. (If the program is already running, just click on File > Convert.)
    b. In the conversion window, enable Break the drawing.
    c. In the next step, select your CAD file.
C) Now, start the nesting program to create a new job as follows.
    a. Select the option ITEM-List from the top row.
    b. Do Material selection.
D) Then, proceed as usual.
E) You will see a nested layout on your screen after some time, which you will be able to modify.

Note

1) Item-list file is automatically deleted at the end of the nesting process described above. It also gets updated while using the drawing program = II-D. So, it is advisable to run all the steps mentioned above together before taking up another part drawing / nesting activity.
2) You can open and modify Item-list file in any text editor after running step B, if you know its structure and if it is really required.

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Case 3 – Import a nested layout with rectangular raw material sheet from a cad file
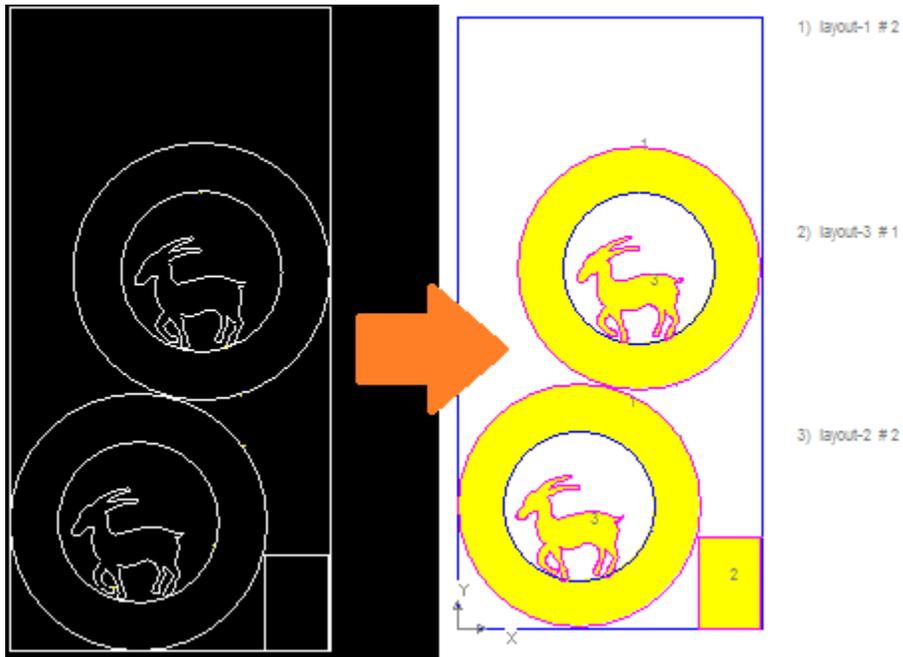
If the CAD file contains a complete nested layout on a rectangular sheet, do the following.

A) Start our drawing program = II-D and click on Convert dxf / plt files. (If the program is already running, just click on File > Convert.). Then, do the following.
   a. Select the CAD file when the software asks you to do so.
   b. After successful conversion, you will be able to see the layout drawing. Now, do the following.
      i. Click on the outermost rectangle that represents raw material sheet to select it.
      ii. Click on the menu Modify > Properties.
         • Type Sub-class as 2. (Sub-class is different from class. So, do not change class.)
         • Click on the button >> at the bottom.
      iii. Press the ESCAPE key on the keyboard to un-select the raw material sheet.
      iv. Select the menu Modify > Clean.
      v. Save the drawing in an MDF file using the command File > Save As. (Do not generate leaders or sequence while saving the file.)
B) Now, start the nesting program to create a new job as follows.
   a. Enable Custom selection.
      i. Enable Layout.
   b. Do Material selection.
C) In the next step, select the MDF file you created at the end of step A, described above.
D) Then, proceed as usual.
E) You will see a nested layout on your screen after some time, which you will be able to modify.

Note

1) Make sure that the layout drawing contains rectangular raw material sheet and its longer along Y axis.
2) It is desirable to draw the raw material rectangle such that its bottom-left corner is located at (0,0).

Case 4 – Create Item-list from individual MDF files
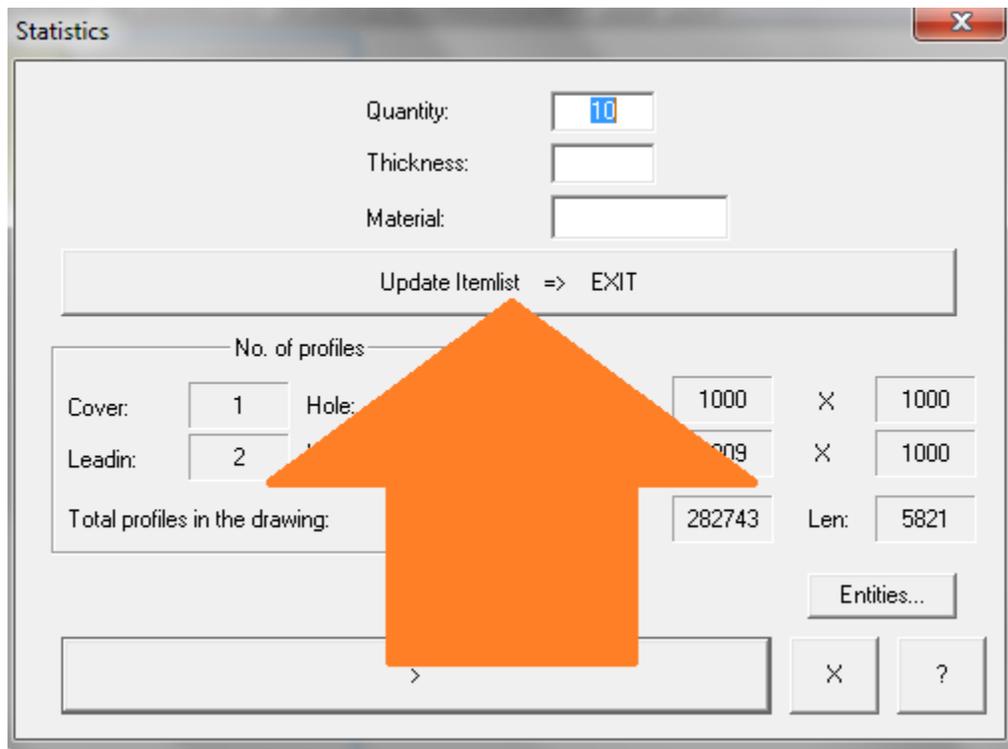
If you want to create an item-list using part drawing files which have been already saved in separate MDF files, do the following.
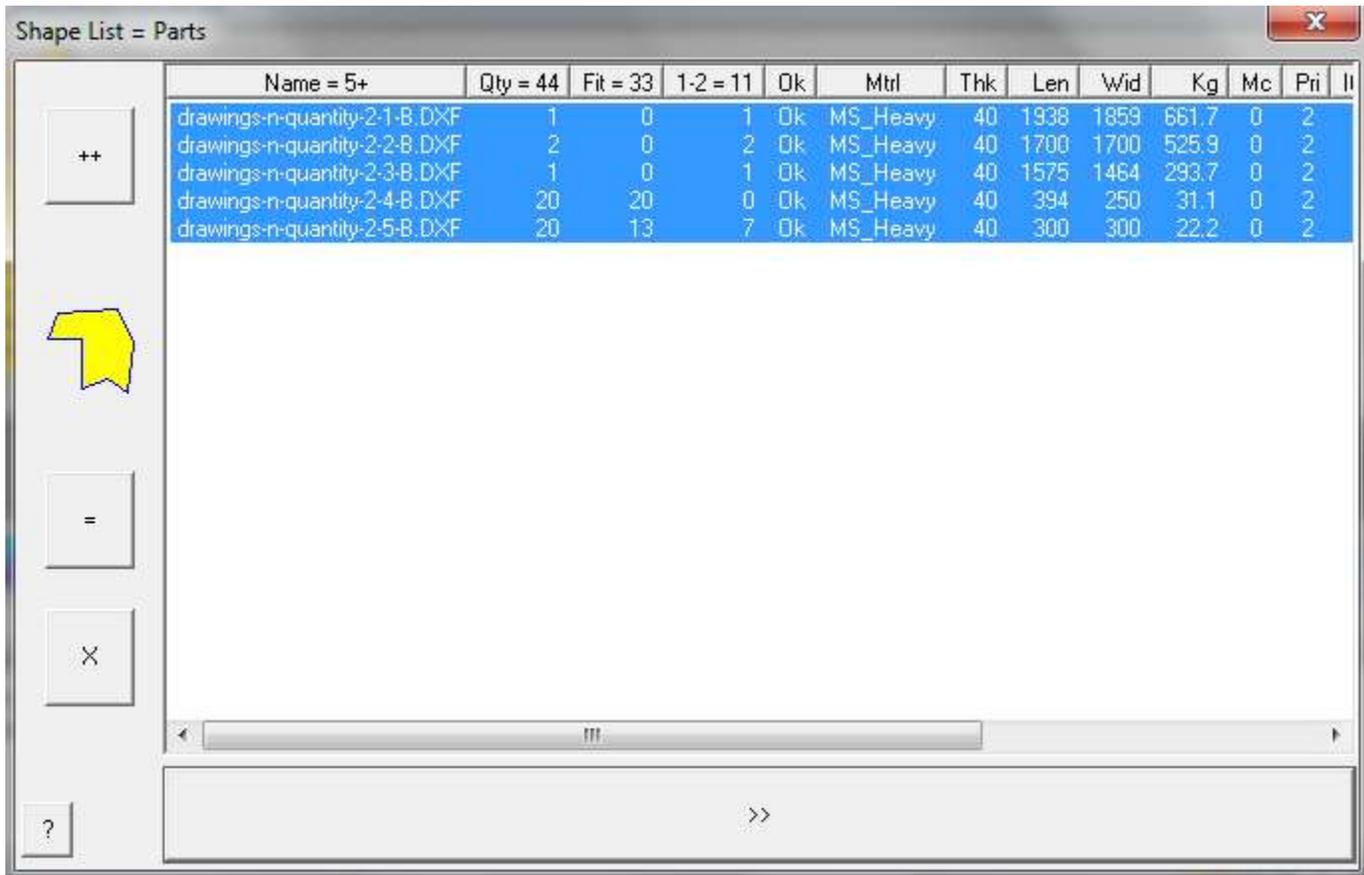
A) Delete the previous item-list file = C:\g0xin\00.txt. (Ignore, if item-list is absent or empty.)
B) Create a new item-list as follows.
   a. Double click on the MDF file of the next part drawing to be added. (If it fails to start our drawing program = II-D, launch the program directly and open the MDF file using the menu File > Open.)
   b. You will see the drawing statistics on your screen, as shown in the image above.
      i. Type the Quantity.
      ii. You may also type Thickness & Material. (However, in that case, make sure that your material table = C:\g0xin\materials.csv contains data for this material & thickness.)
      iii. Click on the button Update Itemlist => Exit (see the image above) & close the program.
   c. Repeat steps a - f (described above) for each part drawing you would like to add to the item-list.
C) Now, start the nesting program to create a new job as follows.
   a. Select the option ITEM-List from the top row.
   b. Do Material selection.
D) Then, proceed as usual.
E) You will see a nested layout on your screen after some time, which you will be able to modify.

Note

1) Item-list file is automatically deleted at the end of the nesting process described above. It also gets updated while using the drawing program = II-D. So, it is advisable to run all the steps mentioned above together before taking up another part drawing / nesting activity.
2) You can open and modify Item-list file in any text editor after running step B, if you know its structure and if it is really required.

Case 5 – Create bill of materials after nesting for future use

If you want to create a bill of materials which can be added together to the nesting module next time onwards, do the following.

A) Start the nesting program and create a new job.
B) Select the menu Edit > Shapelist.
C) Click on the part rows which you would like to add to the bill of materials. (The selected parts will be highlighted, as shown in the image above.)
D) Press the INSERT key on the keyboard.
E) The software will ask you to specify the Quantity. Keep it 1.
F) In the next window, the software will ask you to specify the name of the bill of materials file. Specify a suitable name for the file.

Note

1) Next time onwards, you can select a BOM file instead of a CAD file, in order to add the entire group of parts together, to a new job. (However, do not change the locations of the part drawing files which have been included in the BOM file.)
2) You can also type a BOM file in a spread-sheet software, if required. A sample BOM file is included within the installation program. (C:\g0xin\bom.csv.)