

**DXF-AAMA** DXF-AAMA is a file format developed by the American Apparel Manufacturers Association in an attempt to solve the difficulties of using DXF files. DXF is the most commonly used format for the exchange of drawing files. Unfortunately, since they contain neither scale or units, nor usually any method of reliably describing what needs to be cut, drawn, drilled, notched etc. in a pattern file, DXF files are normally not very useful. But if the DXF-AAMA format is used, files can contain many patterns either nested, or non-nested, in a form which can be easily processed and used by plotter operators.

Properly used, DXF-AAMA is almost as good as the Vectorscript format that we mainly use. It is a format which is almost a standard, and if your customers can deliver files in DXF format, using this method you can be almost guaranteed a nestable pattern at the end of it which is a first for DXF.

In a DXF-AAMA file, entities in a pattern are grouped together into a block ("anonymous block" in DXF-speak). (Almost the same as VW symbols or groups.) Files can contain many blocks, each with an insertion point in the Entities section of the file. Using blocks, a file containing many instances of the same panel is much smaller than a similar file without blocks.

Each block has several layers used to describe the intent of the entities on the layer. These layers have specific names or numbers describing the intent of the layer and the tool used to plot the layer. (Names are clearer and easier to debug.) So layers can be called:

| <b>Number</b> | <b>Name</b>  | <b>Tool</b>          |
|---------------|--------------|----------------------|
| 1             | CUT, OUTLINE | Rotary Blade         |
| 8             | DRAW, INK    | Marker tool          |
| 11            | INTCUT       | Rotary or drag blade |
| 13            | DRILL        | Drill punch          |
| 4             | NOTCH        | Notch or drag blade  |
| 19            | TEXT         | Marker               |
| 26            | REF          | Reference            |

**CUT layers contain the pattern outline which must be a single closed polyline or polygon. (This rule applies to VW outlines and outlines used in almost all nesting programs). This is essential to allow nesting.**

DRAW layers contain any plotted element sent to the marker pen and can contain any of the normal DXF entities such as polyline, line, circle or arc.

INTCUT layers contain internal cut items and can contain any of the normal DXF entities such as polyline, line, circle or arc.. These are sent to a different tool to the outline to allow cut ordering. Obviously these entities can be sent to the same rotary blade tool, but can be cut before or after the outline as required.

DRILL layers contain point data only, and are sent to the drill punch.

NOTCHes are a garment specific item and are non-standard DXF. They would be hard to reproduce with a standard CAD package since they are formed by using a point for the insertion, with a direction and length stored in fields normally used for Z axis and radius coordinates. Where people want to draw a notch by hand in a CAD program, they would be best to include this as a simple cut on an INTCUT layer.

TEXT items are used for panel numbering and should contain an insertion point and the relevant text. Text items in DXF-AAMA files are handled the same way as text in a Vectorworks file. The text is substituted for vector based text, and controlled in the text options in Tangent preferences.

Any items sent to layers called REF, NONE, DIMENSION, INVISIBLE will be optionally ignored or sent to tool 8 (grey) which will screen in Tangent, but not be cut. Users can put their normal drawing details in these layers and not have them cut.

What's missing? AAMA files ignore items commonly used in industrial textiles work including Creasing and more than one internal cut tool. For that reason, we've added support for these items on layers called:

| Number | Name     | Tool                 |
|--------|----------|----------------------|
|        | CREASE   | Creaser              |
|        | INTCUT2  | Drag or rotary blade |
|        | INTERNAL | Drag or rotary blade |
|        | RECIPRO  | Recipro Cutter       |
|        | DRAG     | Drag blade           |

If you have customers who regularly deliver, or attempt to deliver, eccentric DXF files, this format will help both parties get consistent results.

## **Creating a DXF-AAMA file**

This section is written for people who are creating DXF drawings for import into Tangent or any other nesting and plotting program.

The majority of problems with DXF files are caused by people, not software. There are a few things which will reduce these problems considerably. Communicate! Think! In most cases, the entire drawing is neither needed nor wanted. The purpose of the drawing is to generate tool paths for a machine. So bear that in mind when formatting and exporting. In most cases nobody will need to open the drawing in a CAD program, so eliminate what is not essential.

Find out what is needed in a drawing and format and export your drawings accordingly. If you know a few things about the file which you are trying to exchange, it is far easier to translate it. You should communicate...

The Scale,

The Units,

The Fabric Width,

Which program originated the drawing and which version of DXF you have used to export the file. DXF release 12 is the safest.

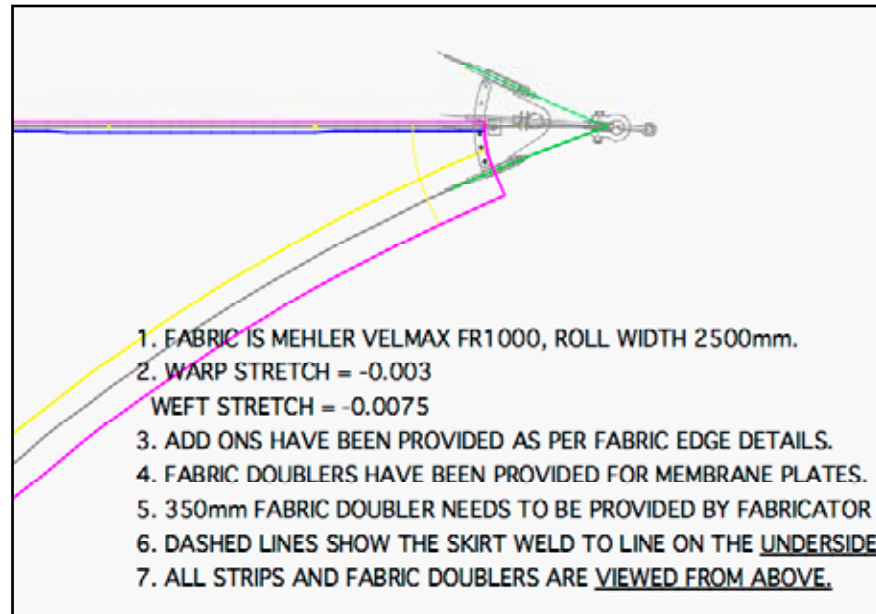
All that's necessary to create a DXF-AAMA file is to format the drawing in a specific way. The drawing needs to have a layer for each type of tool you want to use. The layer can be numbered or named with the special layer names detailed below (CUT, DRAW, DRILL etc.)

Once a drawing is set up correctly, save it as a template. Probably the best way to work is to copy patterns from the original drawing and paste into the AAMA template and then export as a DXF file.

Bear in mind what the drawing represents... it is not something to be printed on paper or viewed on screen. The drawing is data for a cutter, and all lines represent tool paths. The more garbage there is in the file, the more likely you are to have problems.

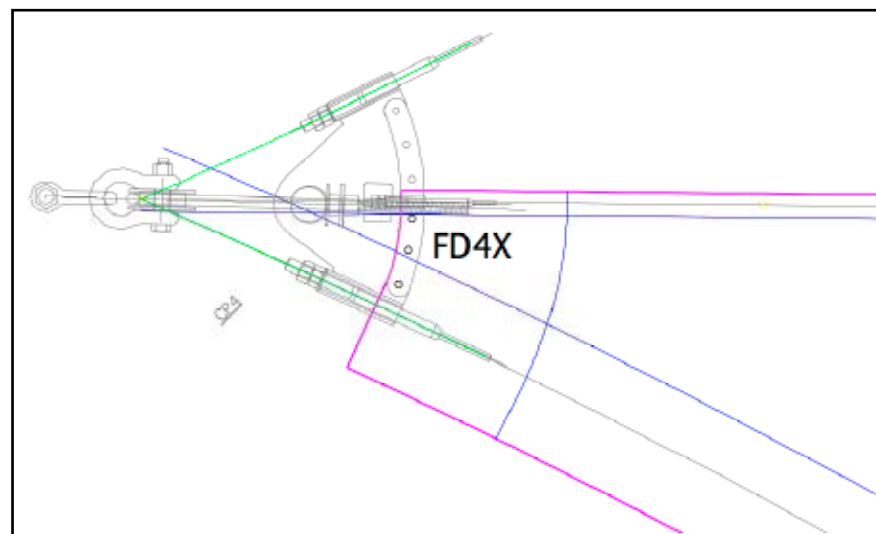
Any entities which are not to appear on the cut pattern have to be put on a reference layer or deleted. This applies to all title blocks, engineering details etc.

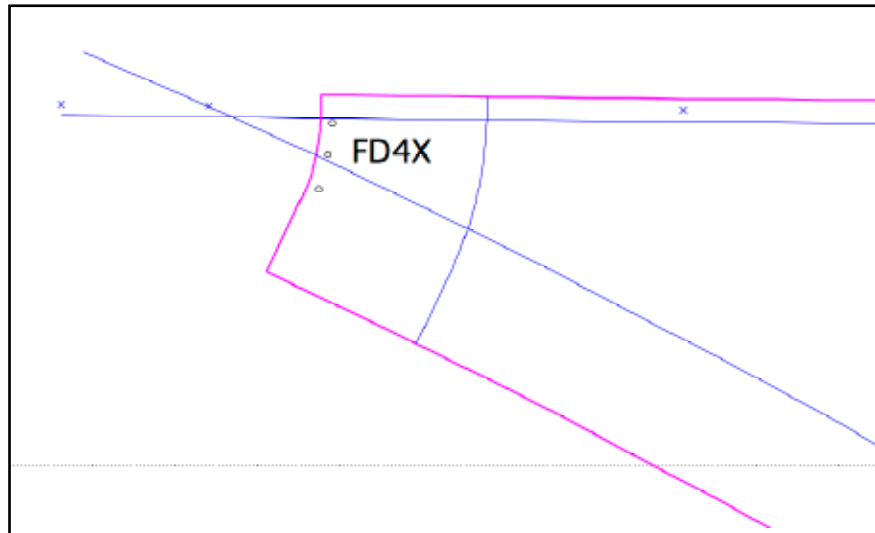
The picture below shows a lot of what should not be present in a file intended for cutting.



To begin with, start by creating and exporting simple DXF-AAMA files to Tangent. When you are sure your scale and units are correct, and that the layers in your template give you enough flexibility with the tools you want to use, you can start to work with more complicated files. It is possible with many CAD programs to write a macro or plug-in tool to automatically format a DXF-AAMA drawing.

Bear in mind some of the basics. An outline is an outline. Everything you want drawn or cut in a panel **MUST** be inside the outline (or it isn't an outline is it?) This is especially important when nesting since the nesting routines in most programs use the outline and ignore entities inside a pattern.





When you delete the non-essential items, you can see more clearly that there are markings extending way off the edge of the pattern. These are almost certainly going to cause problems.

The extended drawn lines can cross onto adjoining panels. The strike-up marks may be interpreted as strike-ups and patterns welded wrongly, or if the fabricator does not have a drill-punch on their plotter and marks eyelets with crosses, you may get eyelets pressed into patterns where they are not wanted.

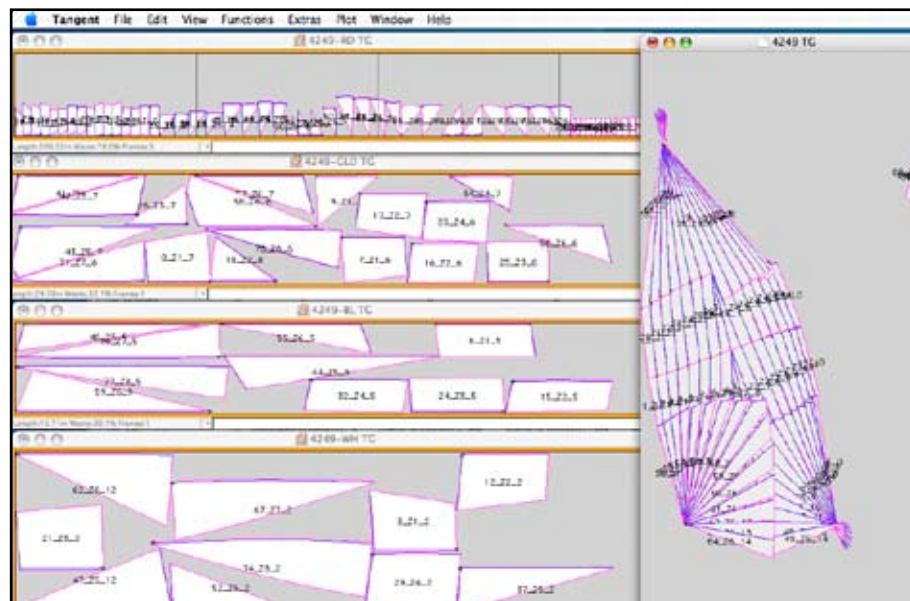
The drill marks are also drawn as circles. This may be correct for a drawing, but for a plotter with a drill punch, eyelets to be drilled should be marked with a locus, or point coordinate pair. And if the eyelet is too large to do with a drill punch, and has to be cut with a drag knife tool, then it should be drawn on an INTCUT or DRAG layer.

## Multiple panels and queue Windows

The advantage of using DXF-AAMA as a file format (compared with almost anything else other than Vectorworks, EPSF or some proprietary format such as Plotmaker ASCII or NTV,) is that it is easy to set up files which contain more than one panel, and even more than one type of fabric. Strictly speaking, multiple fabrics are not part of the AAMA format, but since they do not break the format, it works fine.

To set up a multiple panel file, you just group (make BLOCKS) of your panels. Each entity in the panel has a layer or class name or number. Each BLOCK contains just the items for one panel. The same mechanism is used for creating panels by using groups in Vectorworks or Illustrator files.

The DXF format supports a separate layer or class name for the BLOCK itself. So, while each entity within the BLOCK has its own layer name (CUT, OUTLINE, DRAW etc.) you can give the BLOCK itself another layer name such as FABRIC1, FABRIC2 etc.



When imported into Tangent, this type of file will generate a new window for every type of fabric it finds in the file.

**CAUTION!** If you are not careful, your files can contain layer names outside the BLOCKS section of the DXF file (in the ENTITIES section of the file) which can generate new queue windows in Tangent. In many cases these windows will be empty. This is not so much a fault in Tangent as a fault with the file. Normally, deleting the windows will not cause problems.

**DXF-AAMA  
Layer Names**

| Layer Number | Alternative Layer Name | Tool                      |
|--------------|------------------------|---------------------------|
| 1            | CUT, OUTLINE           | Rotary Blade              |
| 4            | NOTCH                  | Notch or drag blade       |
| 8            | DRAW, INK              | Marker tool               |
| 9            | STRIPE                 | Grid or Stripe reference  |
| 10           | MARKER                 | Marker or Plaid reference |
| 11           | INTCUT                 | Rotary or drag blade      |
| 13           | DRILL                  | Drill punch               |
| 15           | TEXT                   | Annotations               |
| 19           | TEXT                   | Marker                    |
| 26           | REF                    | Reference                 |
|              | CREASE                 | Creaser                   |
|              | INTCUT2                | Drag or rotary blade      |
|              | INTERNAL               | Drag or rotary blade      |
|              | RECIPRO                | Recipro Cutter            |
|              | DRAG                   | Drag blade                |

**Typical DXF-  
AAMA panel**

