Integration Guide
Nesting DXF Format

I. General information

Nesting DXF Format is based on the Standard DXF R12 format, a CAD data file format specially designed to enable data interoperability between CAD systems. This format is a tagged data representation of all the information intended to be transferred from one CAD application to another. Tagged data means that each data element in the file is preceded by an integer number which indicates what type of data element follows.

The extended format presented in this document uses only a small part of the available data types in the standard format and also introduces some new data types so that the nesting information can be easily transferred to our software.

You can use the sample dxf files delivered with this document and the below sections to understand the general structure of a dxf file that can be correctly interpreted and used in the nesting process.

II. Shapes

All shapes are extracted from the BLOCKS section of the DXF file. For each shape there should be a BLOCK entity with a unique name in the DXF file. The first POLYLINE entity is treated as the contour of the shape that has to be imported.

For each BLOCK a single INSERT entity has to be present in the ENTITIES section. The match will be done by comparing the names of the two entities (ignore cases method will be used). This means that each shape generates a single shape instance for nesting.

III. Shape instance parameter

The shape instance parameter will be specified as text under the "999" group (comment) inside the shape instance INSERT. The required structure is: "<Parameter Name>:<Value>".

Expected parameter:

1. Bundle group nexus

   - DXF Name: Bundle

   - DXF Value: Any integer value

   - Usage: All shape instances with the same bundle index will be grouped together (This does not directly implies rotation or flip dependency).

   - Optional: YES

   - Default value: NONE – The shape instance has no relation whatsoever with another shape instance.

IV. Nesting information

The nesting enhancements will be added into the DXF file as TEXT entities, on a layer named "NESTING_SETTINGS".

These settings can be added independently for each shape if they are inserted in the related BLOCK entity, or they are considered global parameters for the nesting procedure if they are found in the ENTITIES section.

The general structure of the TEXT entities will be: "<Parameter Name>:<Value>". The value is taken as all the characters that immediately follow the ":" until the new line character. Note that all the leading or trailing spaces between characters ":" and "\n" are truncated.

Expected nesting parameters:

1. Rotation group status
   - DXF Name: NGROUP
   - DXF Value: One of <TRUE, FALSE>
   - Usage: TRUE – the shape instance has bundle dependent rotation allowance
     FALSE – the shape instance has independent rotation allowance
   - Presence: Only as shape parameter
   - Optional: Yes
   - Default value: FALSE
2. Flip group status
   - DXF Name: FGROUP
   - DXF Value: One of <TRUE, FALSE>
   - Usage: TRUE – the shape instance has bundle dependent flip allowance
     FALSE – the shape instance has independent flip allowance
   - Presence: Only as shape parameter
   - Optional: Yes
   - Default value: FALSE
3. Rotation allowance
   - DXF Name: ROT
   - DXF Value: One of <0.0, 45.0, 90.0, 180.0, FREE>
   - Usage: Defines the rotation freedom for the shape instance
   - Presence: Shape parameter and global parameter
   - Optional: Yes (If absent the global rotation allowance will be used)
   - Default value: 0.0

4. Horizontal flip allowance
   - DXF Name: HFLIP
   - DXF Value: One of <TRUE, FALSE>
   - Usage: Defines the horizontal flip freedom for the shape instance
   - Presence: Shape parameter and global parameter
   - Optional: Yes (If absent the global horizontal flip allowance will be used)
   - Default value: FALSE
5. Vertical flip allowance
   - DXF Name: VFLIP
   - DXF Value: One of <TRUE, FALSE>
   - Usage: Defines the vertical flip freedom for the shape instance
   - Optional: Yes (If absent the global vertical flip allowance will be used)
   - Default value: FALSE

Note:

Horizontal flip activated: the shape instance can flip around Ox axis.

Vertical flip activated: the shape instance can flip around Oy axis.

Important: For direct transfer or integration using another format please consult the specific documentation because the interpretation of horizontal and vertical flip might be different.

Expected global parameters:

1. Measurement unit
   - DXF Name: UNIT
   - DXF Value: One of <MM, CM, INCH>
   - Usage: Defines the unit of measurement used for the Cartesian coordinate system.
   - Optional: Yes
   - Default value: MM
2. Marker width
   - DXF Name: WIDTH
   - DXF Value: Double precision value
   - Usage: Defines the width of the marker to be nested.
   - Optional: YES
   - Default value: 1600.0 mm