

Drawing Design Rules

LinkCAD facilitates the exchange of design data between various CAD systems and mask making machines. LinkCAD tries to preserve as much as information as possible when converting a design from one format to another. However, some CAD formats contain graphical entities that do not have an equivalent entity in another format. To avoid any surprises you should observe a few design rules, which are described below.

Rule 1: Use zero-width closed polylines

No matter what CAD system you use, draw filled areas using zero-width closed polylines. In AutoCAD, use the *close* command to completely close the polyline.

Areas drawn using zero-width closed polylines appear as filled areas on your mask, even though some CAD systems, such as AutoCAD, only display the contour of the bound area. Others allow you to display the filled area. LinkCAD View supports both [display modes](#).

If you are using AutoCAD, you may also use SOLID entities to draw filled areas. This has the advantage that AutoCAD fills the SOLID's interior. LinkCAD treats SOLIDS just like zero-width closed polylines.

Rule 2: Don't use hatching

Hatching is ignored by LinkCAD, as they don't translate well between the different file formats. Don't use hatching to indicate filled areas on the mask, instead draw the area's contour using zero-width closed polylines (see rule 1).

Rule 3: Close open boundaries using LinkCAD's polygon repair feature

Filled areas are often bound by a series of zero-width polylines. For instance, the drawing below consists of a polyline with straight line segments, and a polyline with an arc segment.



Series of zero-width polylines

If you want to fill the interior of the drawing, you need to join the two polylines, and create a single zero-width closed polyline. LinkCAD can do this automatically for you: if LinkCAD detects open zero-width polylines, it displays the *Repair Open Polygons* dialog. Select the option *Join adjacent open polygons* to merge the open polylines into a single, zero-width closed polyline.

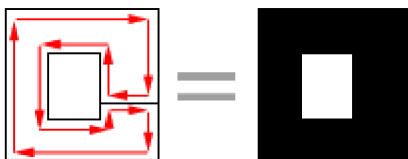
Rule 4: Avoid drawing polylines with more than 200 vertices

The GDSII file format, and some flavours of CIF, does not support polylines with more than 200 vertices. LinkCAD splits larger polygons into smaller sub-polygons when you convert to these formats. If you need better control over the sub-polygons, limit yourself to a maximum of 200 vertices per polyline.

Rule 5: No self-intersection

A polyline may not self-intersect. If it does, the result is unpredictable.

A polyline may, however, touch itself. This is called a re-entrant boundary, and it can be used to draw filled areas containing holes, as in the drawing below. Make sure your destination CAD system supports re-entrant boundaries before using them.



Drawing filled areas with holes using re-entrant boundaries

Tip: Alternatively, if you are creating your design in a DXF compatible program (eg. AutoCAD), you can use the **REGION** entity and the boolean operations between REGIONS (subtraction, intersection, ...) to describe polygons with holes. LinkCAD automatically converts such REGIONS to a single re-entrant polygon.