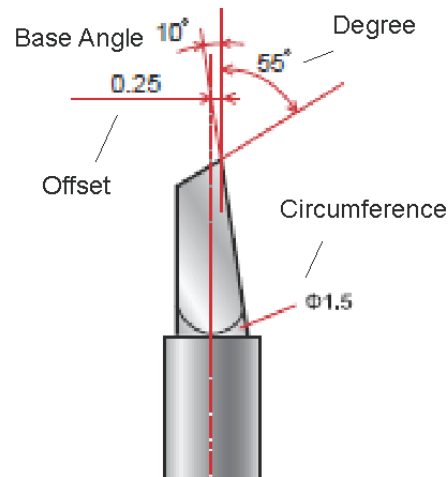




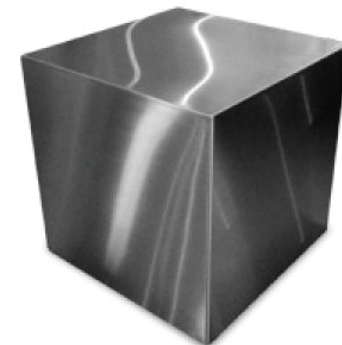
CUTTER BLADE KNOWLEDGE

CUTTER BLADE KNOWLEDGE



❖ Cutter Blade Materials

- Steel Tip
 - Rarely used anymore and difficult to find
 - Material is ductile and less prone to chipping
- Carbide or Cemented Carbide
 - Provides excellent wear resistance and hardness
 - Material offers better rigidity than steel which enables the cutter blade to provide better cutting accuracy
 - Brittle material and can be chipped if dropped or dense material is cut
 - Can be sharpened better than steel blades, but lifespan is shorter



CUTTER BLADE KNOWLEDGE

❖ Blade Angle

- Blade angle should be chosen based on thickness and density
- Thickness is determined by substrate without backer
- Density is determined by material construction and lamination
- Blade should be able to cut through entire substrate layer and into the backing without going deeper than blade edge



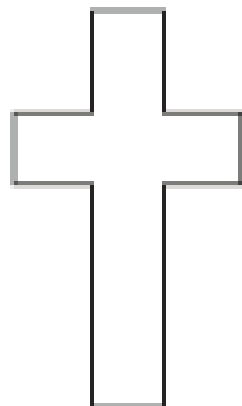
CUTTER BLADE KNOWLEDGE

❖ Blade Offset

- The offset determines the blades turning radius and compensation from the cutting carriage
- A blade with a higher offset can handle thicker/laminated substrates better
- Offsets over 1mm are simulated to compensate for material properties to avoid Figure B below

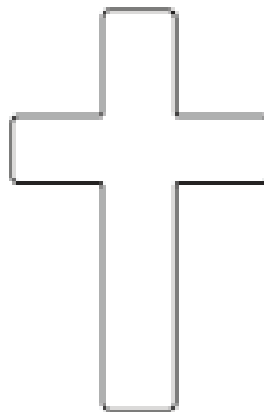
Perfect

A



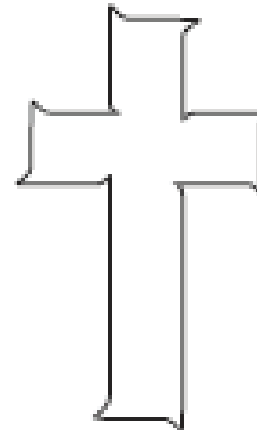
Not
Enough

B



Too
Much

C



CUTTER BLADE KNOWLEDGE

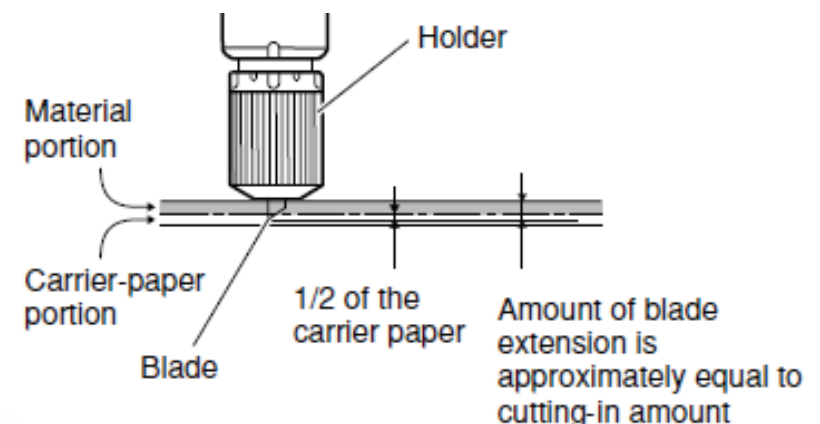
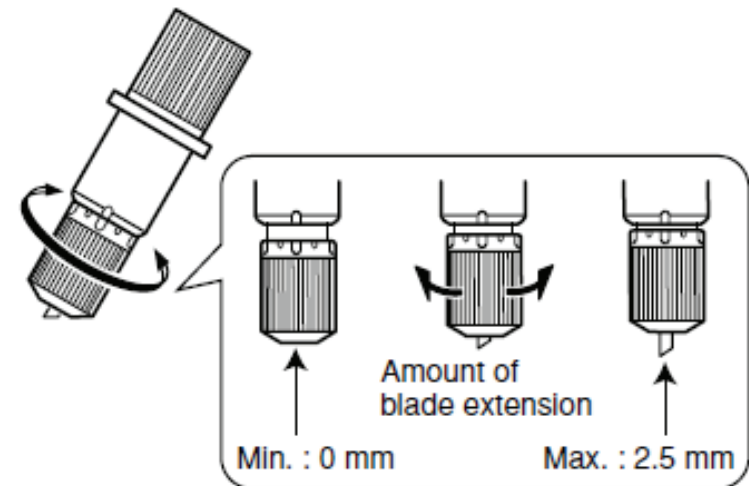
❖ Blade Extension

- Changing blade extension can substitute for changing pen pressure
- Max blade extension is designed for pre-printed graphics
- Blade extension should be minimized for cut substrates
- Change blade extension by twisting blade holder cap
- Blades with shorter blade edges need less extension

[Rough Estimate for the Amount of Blade Extension]

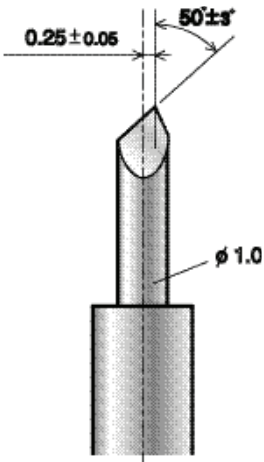
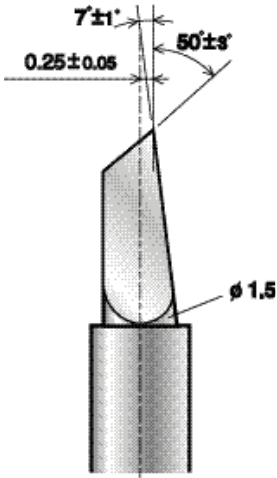
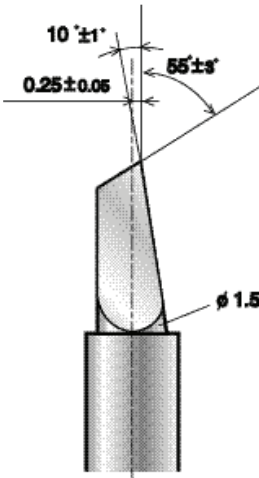
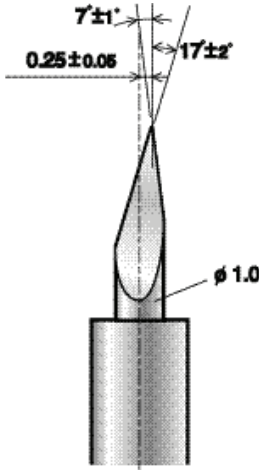
Use the following dimension as a rough estimate for setting the amount of blade extension.

$$\text{Amount of blade extension} = \text{Thickness of the material portion} + \frac{\text{Thickness of the carrier paper}}{2}$$



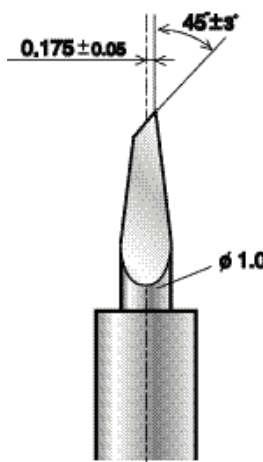
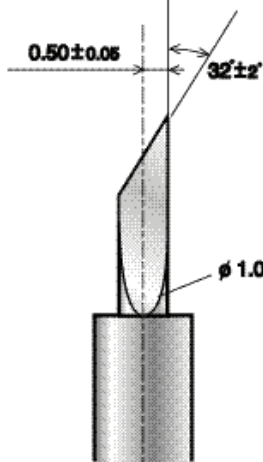
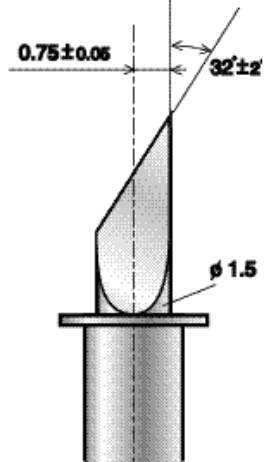
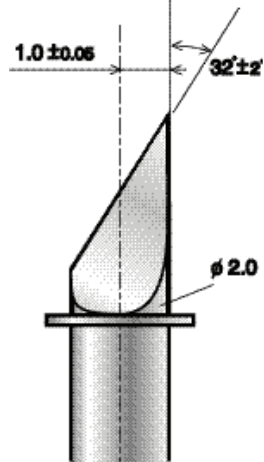
CUTTER BLADE KNOWLEDGE

❖ Roland DG Blade Options

Model	ZEC-U1005	ZEC-U5025	ZEC-U5022	ZEC-U1715
Offset	0.25	0.25	0.25	0.25
Angle	50 degree	50 degree	55 degree	17 degree
Characteristics	Strong	Sharp	Sharp	Sharp
Sheet	Ordinary Vinyl	Ordinary Vinyl Reflection Sheet	Ordinary Vinyl Reflection Sheet	Sand Blast
Life Expectancy	8,000m	4,000m	4,000m	Depends on the sheet
Design				

CUTTER BLADE KNOWLEDGE

❖ Roland DG Blade Options

Model	ZEC-U3017	ZEC-U3050	ZEC-U3075	ZEC-U3100
Offset	0.175	0.5	0.75	1
Angle	45 degree	32 degree	32 degree	32 degree
Characteristics	Sharp	Sharp	Sharp	Sharp
Sheet	Ordinary Vinyl for Small Characters	Sand Blast Card Board	Sand Blast Card Board	Sand Blast Card Board
Life Expectancy	Depends on the sheet	Depends on the sheet	Depends on the sheet	Depends on the sheet
Design				

CUTTER BLADE KNOWLEDGE

❖ Common Cutting Problems & Solutions

- Incomplete Cuts
 - Problem:
 - Vinyl is not cut all the way through
 - Possible Solutions: (in order of diagnosis)
 - Blade dull or chipped (causes friction and doesn't stay deep, but planes on surface like a boat)
 - Improper blade extension (blade can't dig deep enough because blade holder cap interferes)
 - Pen pressure not high enough (same as improper blade extension)
- Stitch Cut or Dash Cut
 - Problem:
 - Cut lines in dashes or even spaced sections
 - Possible Solutions:
 - Blade chipped or dull (can't cut material and jumps due to friction)
 - Blade holder needs lubrication or replacement (blade doesn't swivel properly due to friction)
 - Slow speed (same as blade being chipped or dull)
 - Replace damaged cutter strip (blade caught in grooves and jumps to next location)

CUTTER BLADE KNOWLEDGE

❖ Common Cutting Problems & Solutions

- Circles Don't Close
 - Problem:
 - Vectors do not connect according to artwork on screen
 - Possible Solutions:
 - Use sans serif fonts (Serif fonts have sharp angled corners and the blade can't turn fast enough)
 - Points need to be rounded (vector graphics that have small angles like serif fonts. e.g. - flame tips)
 - Incorrect offset (Plotter is over or under-compensating for vector curve)
- Small Letters and Shapes Lift Up During Cutting
 - Problem:
 - Adhesive gels back together under vinyl after being cut
 - Possible Solutions:
 - Use vinyl with a different adhesive (some adhesives don't adhere to the liner well enough for small detail. Removable/low tack adhesives are most common problem)
 - Increase blade extension (adhesive may be too thick and not cut all the way through)
 - Replace blade (sharper blade cuts adhesive better)
 - Use higher angle blade (low angle blade may not cut through adhesive effective enough)
 - Increase pen pressure (liner could be soft and absorbing adhesive causing it to gel together)