Superscript and Subscript Metrics

In High-Logic® Font Creator 7.0

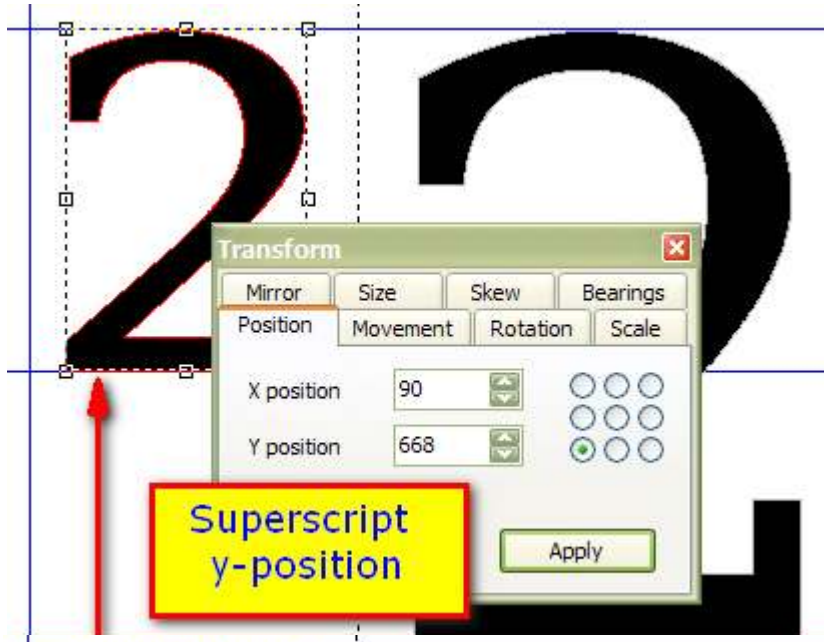
The font metrics for superscripts and subscripts are found from the Font menu, Properties, on the General tab. These values can be used by applications to calculate the size and position of superscripts and subscripts. Adding these metrics to your fonts will ensure that superscripts and subscripts are the right size and position in applications that use these metrics.

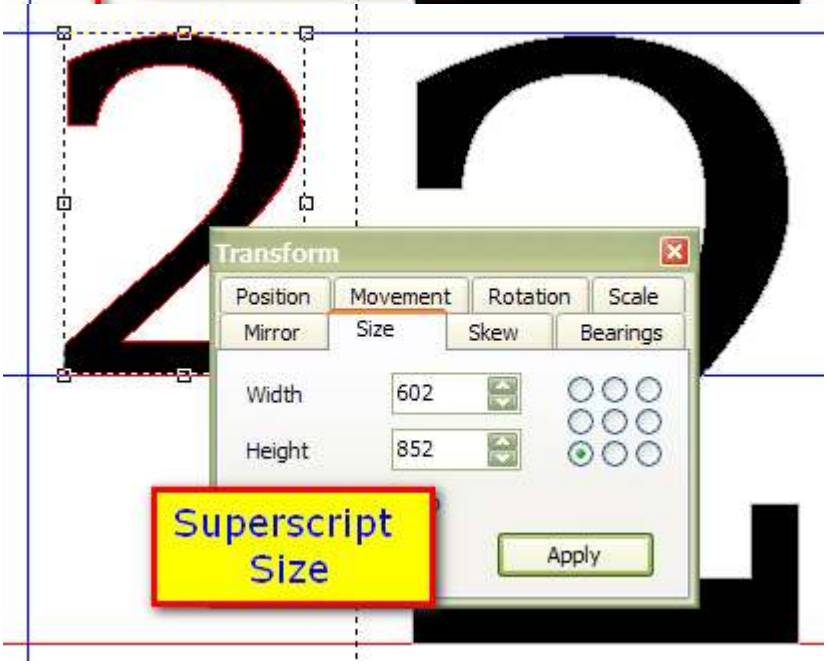
To calculate the metrics for your fonts, you need to take some measurements using the transform tool or the status line. I have measured the superscript 2, which is found in most fonts. The superscript Y position, which is the desired height of superscripts above the baseline in **funits**, I call the **SupS Position.**

To calculate the Superscript y-offset from this value we need to know the size of superscripts relative to the figures in the font. To get this scale factor I measure the zero and the superscript zero. If your fonts lack the superscript zero, you could use the figure 2 and superscript 2.

Select the glyph and note the width and height on the Size tab of the Transform toolbar. I call these values **SupS Width** and **SupS Height** respectively.

Do the same for the figure 2 to get the values for **Figure Width** and **Figure Height.** Note the funits/em value for your font on the Header tab of the Format, Settings dialogue. This value is often 2048, but may be different for your font.





The value for Superscript Vertical is calculated using the formula:

SupS Vertical = (funits/em) x (SupS Height) / (Figure Height)
For example: SupS Vertical = 2048 x 852/1520 = 1148

And the value for Superscript Horizontal is calculated using the formula:
SupS Horizontal = (funits/em) x (SupS Width) / (Figure Width)
For example: SupS Vertical = 2048 x 602/963 = 1280

The values **Superscript Vertical** and **Superscript Horizontal** can be used by applications to scale superscripts from the figures. Applications may scale in both directions by the same proportion using only the value for Superscript Vertical, but it is better to use a slightly larger scale factor for width to help to compensate for the fact that scaled figures are too light compared to other glyphs in the font. Ideally, a font should contain properly designed superscripts.

The metrics **Subscript Vertical** and **Subscript Horizontal** are calculated in exactly the same way, but since the sizes of subscripts and superscripts are usually the same, there is no need to do the calculations again — just use the values for Superscript Vertical and Horizontal. If you want subscripts to be smaller than superscripts, then you will need to use different values for these metrics.

The position recommended by Microsoft Typography for superscripts is aligned to the tops of figures, but you can define the position that you recommend for your fonts by using these metrics. Too high, and they will clash with descenders in the line above; too low and they may be hard to spot in a line of text. The position of superscripts and subscripts in your fonts is calculated from these formulae:

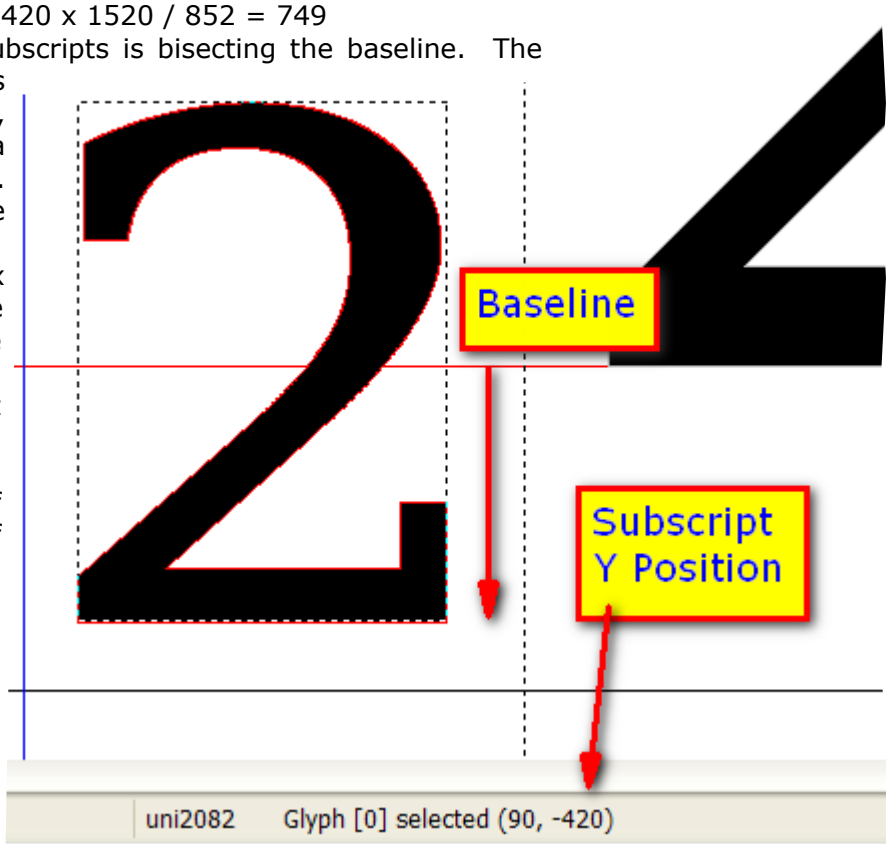
Superscript y offset = (SupS Position) x Figure Height / (SupS Height)
For example: Superscript y offset = 668 x 1520 / 852 = 1192
Subscript y offset = (SubS Position) x Figure Height / (SubS Height)
For example: Subscript y offset = 420 x 1520 / 852 = 749

The recommended position for subscripts is bisecting the baseline. The calculation for Subscript y-offset is similar to that for Superscript y-offset, but the value is expressed as a **positive** offset below the baseline. Negative values will position the subscript **above** the baseline.

The Superscript and Subscript x offsets are calculated from the corresponding y offsets using the caret run. For italic fonts, they are used to offset superscripts to the right and subscripts to the left. Negative values will offset subscripts to the left. The caret run / caret rise = tangent of the italic angle. For an italic angle of 11° the caret run will be 194/1000 which is the tangent of 11°. For upright fonts these values are zero.

The values found on the Settings dialogue are in bold.

The additional metrics for strike-out and underlining are described on the next page.

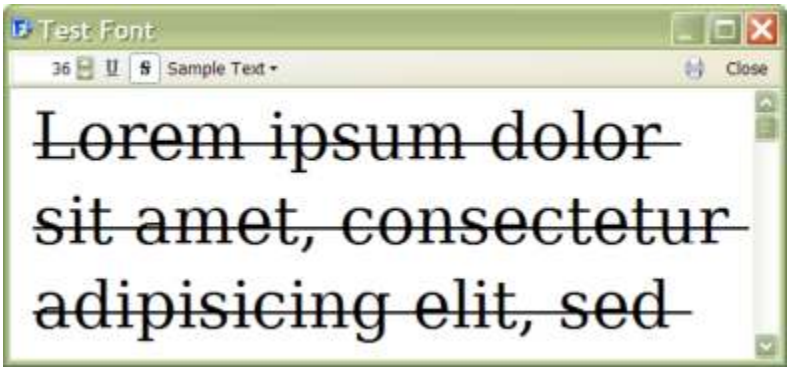


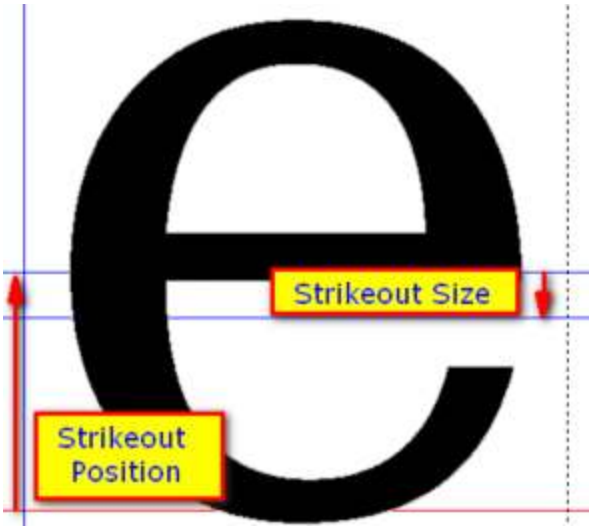
	Font Metrics	Value	Formula	Comments
2	**Funits / Em**	2048	Fixed value for each font	Found on the General tab of the Font Properties dialogue
3	**Win Ascent**	2130	Calculated value	Y Max for all glyphs (see the Metrics tab)
4	**Win Descent**	-531	Calculated value	Y Min for all glyphs (see the Metrics tab)
5	**Line Gap**	1	Entered Value (0 or >)	Use to adjust default leading to the desired value
6	Default Leading	130%	(B3-B4+B5)/B2%	Line spacing as a percentage of font size
7	Figure Height	1520	Measured Value	Height of figures in the font
8	Figure Width	1032	Measured Value	Width of figures in the font
9	SupS Height	852	Measured Value	Height of superscripts / subscripts
10	SupS Width	716	Measured Value	Width of superscripts / subscripts
11	**Superscript Vertical**	1148	B2*B9/B7	Ratio of superscript height to figure height
12	**Superscript Horizontal**	1421	B2*B10/B8	Ratio of superscript width to figure width
13	SupS Position	668	User-definable	Position of superscripts above the baseline
14	SubS Position	420	User-definable	Position of subscripts below the baseline
15	**Superscript y offset**	1192	B13*B7/B9	Position of SupS as proportion of SupS size
16	**Subscript y offset**	749	B14*B7/B9	Position of SubS as proportion of SupS size
17	**x-height**	1063	Calculated Value	Height of lowercase x in the font (see the Metrics tab)
18	**Strikeout Size**	102	User-definable	Weight of strikeout line in funits
19	**Strikeout Position**	530	User-definable	Top of strikeout line above the baseline
20	**Underline Size**	90	User-definable	Weight of underline in funits (see the General tab)
21	**Underline Position**	-85	User-definable	Top of underline relative to baseline (see General tab)
22	**Caret Run**	194	Calculated value	Tangent of italic angle (see Identification tab)
23	**Superscript x offset**	232	B15*B22/1000	Horizontal offset of superscripts for italic fonts
24	**Subscript x offset**	146	B16*B22/1000	Negative horizontal offset of subscripts for italic fonts
	A	B	C	D

Strikeout and Underline Metrics

~~The purpose of strikeout is to show that text should be removed from a draft, it is not intended to make the text unreadable. Its weight and vertical position should be designed so that it does not make the struck-out text hard to read~~.

The Font Test dialogue in FontCreator has check-boxes for strikeout and underlining, so that you can see how your font will look in applications when these attributes are applied. Notice how in this screen shot of Bitstream Vera, the strikeout line is just below the horizontal strokes of the "e" so that there is no confusion between "e" and "o" when strikeout is applied. If it doesn't look right in the Test Font window, it will not look right in applications either.





The strikeout position is the offset in funits from the baseline to the top of the strikeout line.

The strikeout size is the thickness or weight of the strikeout line in funits.

The underlining size and position should be designed not to obscure descenders making text hard to read when underlining is applied.

The underline position is the offset of the top of the underlining stroke relative to the baseline in funits. It is nearly always a negative value, which is below the baseline. The underline size is the thickness or weight of the underline stroke in funits.