

# Length units in T<sub>E</sub>X

The given conversions may suffer from rounding errors and are only for guidance.  
The shown rules are 1 mm thick. Please note that the very short rules may not be rendered correctly on your screen (or printer) and appear longer than they are.

## Absolute Units

<b>Scaled Point</b> <b>Definition</b> The scaled point is defined as 1/65 536 points. <b>Note</b> This is the smallest unit T <sub>E</sub> X uses. <b>Conversion</b> 1 sp = 0 mm = 0.000 02 pt	<b>Millimeter</b> <b>Definition</b> SI unit <b>Conversion</b> 1 mm = 2.845 26 pt = 186 467 sp
<b>Point</b> <b>Definition</b> The point is defined as 1/72.27 inch. <b>Conversion</b> 1 pt = 0.351 46 mm = 65 536 sp	<b>Pica</b> <b>Definition</b> One pica equals twelve points. <b>Conversion</b> 1 pc = 4.217 54 mm = 12 pt = 786 432 sp
<b>Big Point (DTP or PostScript point)</b> <b>Definition</b> The big point is defined as 1/72 Inch. <b>Note</b> Word, InDesign and other DTP applications use this definition for points. <b>Conversion</b> 1 bp = 0.352 77 mm = 1.003 74 pt = 65 781 sp	<b>Cicero</b> <b>Definition</b> One Cicero equals twelve Didot points. <b>Conversion</b> 1 cc = 4.5128 mm = 12.8401 pt = 841 489 sp
<b>Didot Point</b> <b>Definition</b> An old unit used by European printers <b>Conversion</b> 1 dd = 0.376 07 mm = 1.07 pt = 70 124 sp	<b>Centimeter</b> <b>Definition</b> SI unit <b>Conversion</b> 1 cm = 10.000 05 mm = 28.452 74 pt = 1 864 679 sp
	<b>Inch</b> <b>Definition</b> One inch equals 2.54 centimeters. <b>Conversion</b> 1 in = 25.400 13 mm = 72.269 99 pt = 4 736 286 sp

## Relative Units

These units depend on the currently active font size.  
For more details about em and ex see: <http://tex.stackexchange.com/q/4239/4918>

<b>Em</b> <b>Definition</b> Traditionally, an em was defined as the width of a capital M or to be equal to the font size, but today the actual value is defined in the font file. <b>Note</b> This unit should be used for all horizontal distances that should change relative to the font size; the paragraph indentation for instance.	<b>Ex (x Height)</b> <b>Definition</b> Traditionally, an ex was defined as the height of a lower case x, but today the actual value is defined in the font file. <b>Note</b> This unit should be used for all vertical distances that should change relative to the font size.	<b>Math Unit</b> <b>Definition</b> This unit equals approx 1/18 em of the math font family. <b>Note</b> It can only be used for spacing in math mode.
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