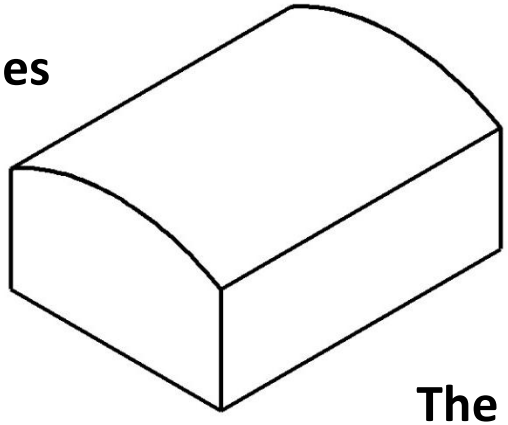
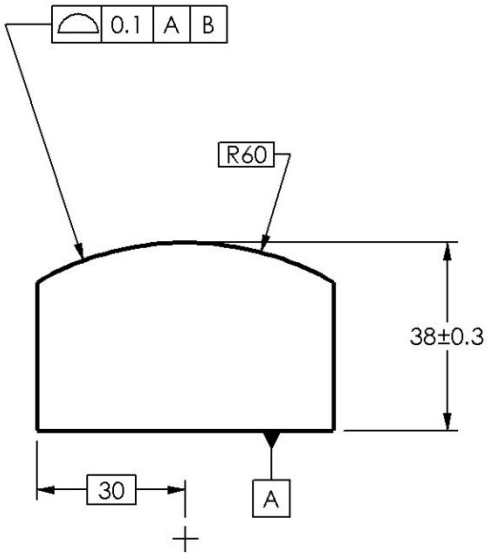
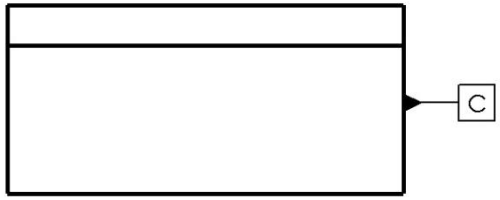
An example part that is sometimes used to explain applications of Profile of a Surface:



Supported by Figure 8-27 & section 8.8, but only for Profile of a Line?

The combination of ± and profile (with no vertical basic) is said to make the profile call-out control only form and orientation:





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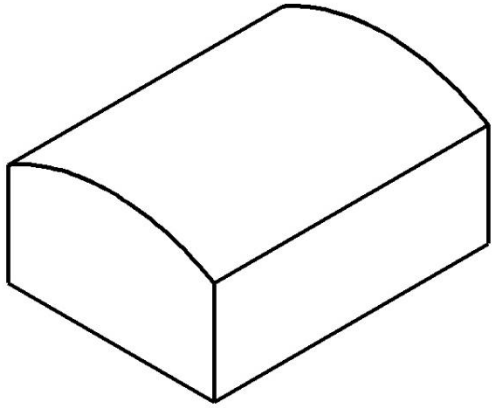
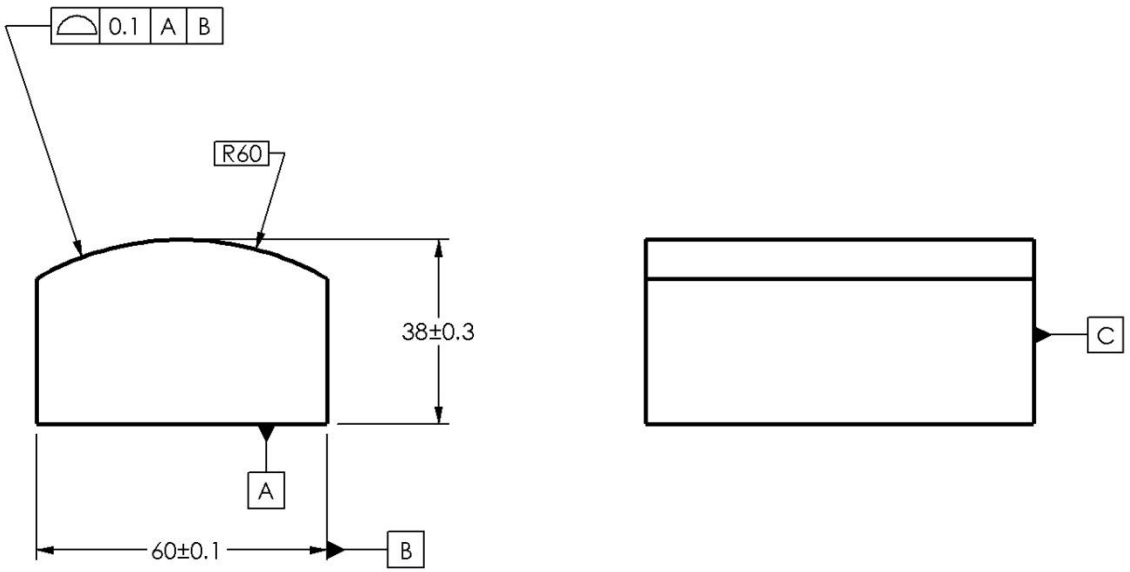
Is the profile tolerance zone now also free to translate horizontally, since there is no horizontal basic dimension shown?





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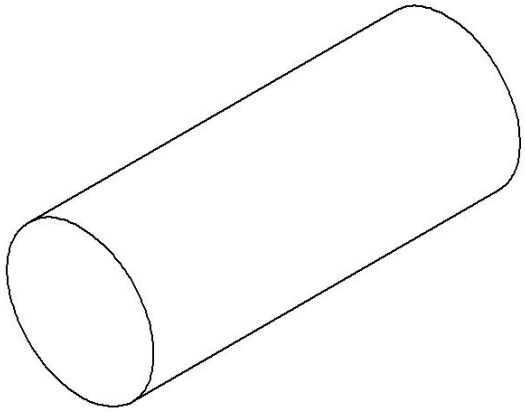
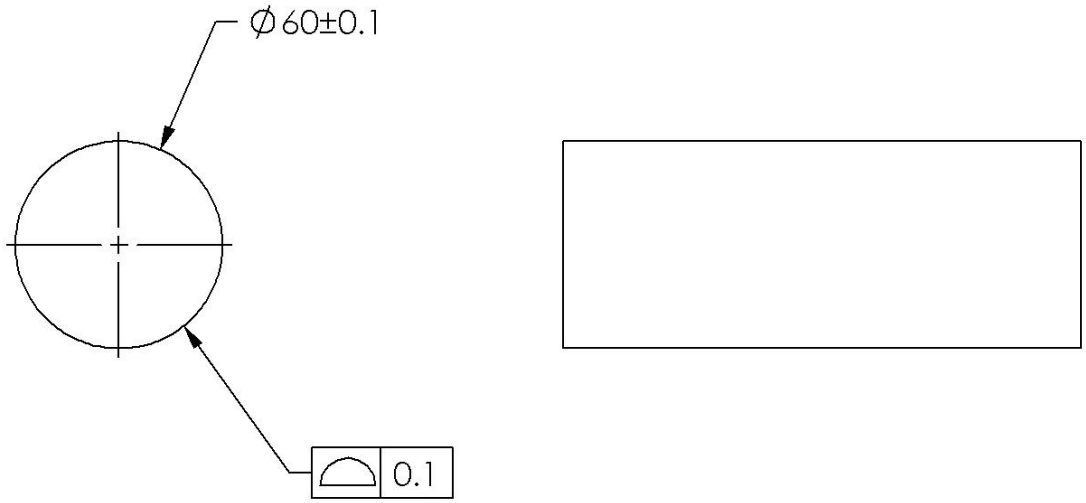
Since no basic diameter dimension is included, does the profile tolerance impose a tolerance zone that is the same as cylindricity?





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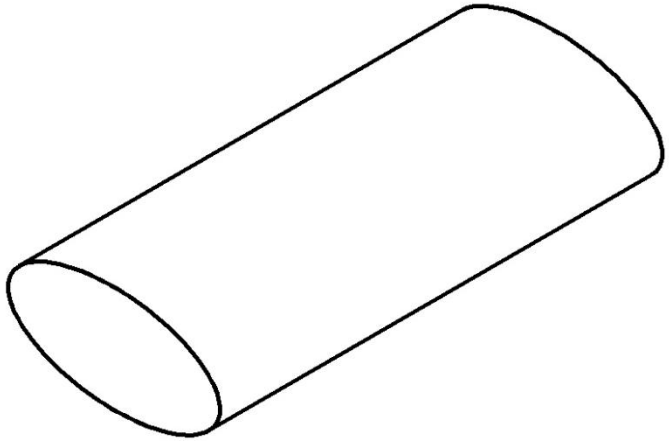
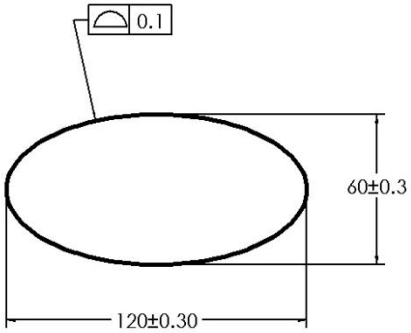
Now with a pin that has an elliptical cross-section, how does this work?



Since basic dimensions must be provided to define the shape of the profile tolerance zone, how can this profile tolerance control only form?



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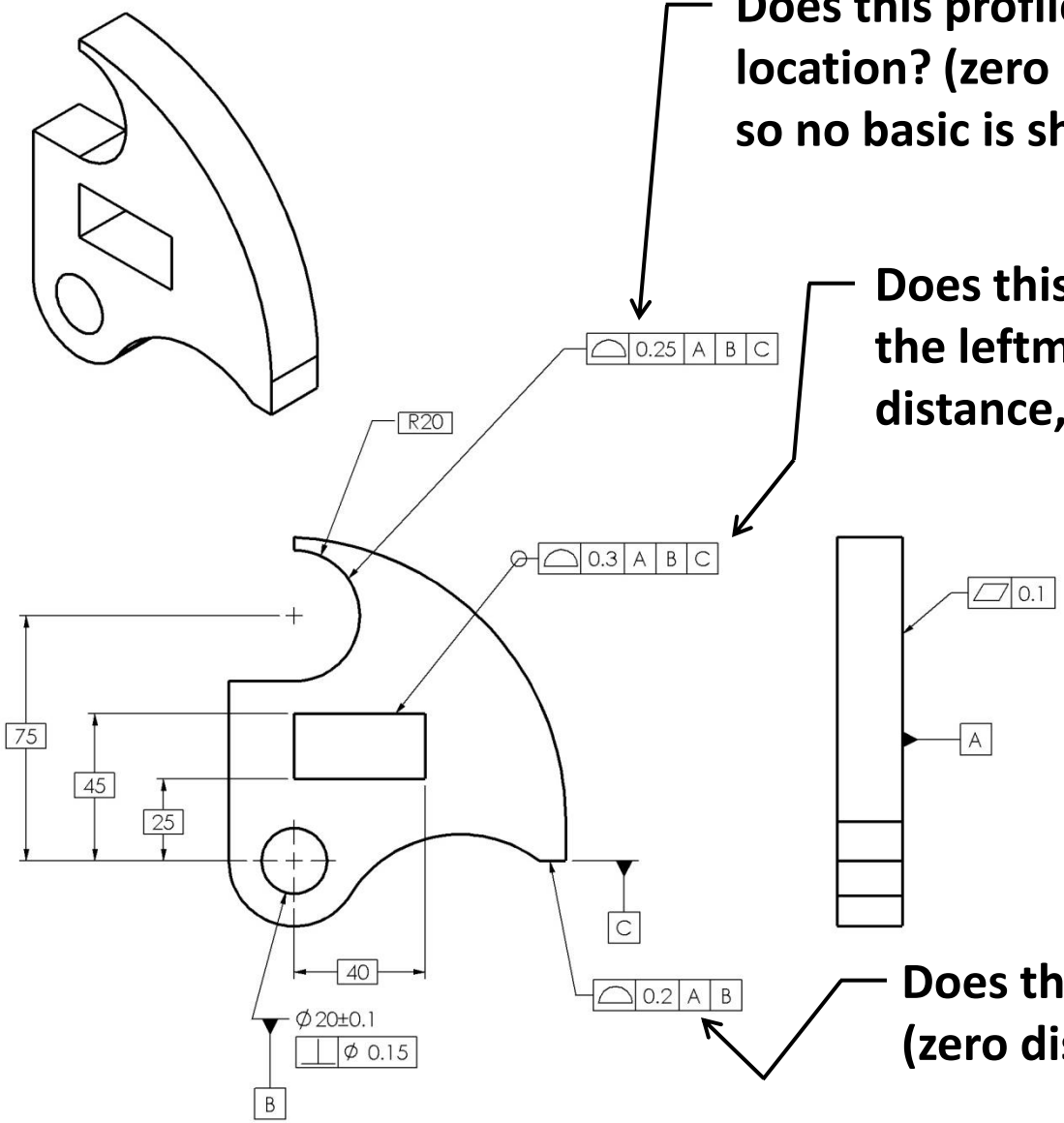

Does this profile control horizontal location? (zero horizontal distance, so no basic is shown)

Does this profile control location of the leftmost side of the hole? (zero distance, so no basic is shown)

Does this profile control location? (zero distance, so no basic is shown)

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More confusing yet, I believe…

What if a drawing is completed per Y14.41, with only annotation of the 3D CAD model? There are likely no basic dimensions shown, just a note stating "BASIC DIMENSIONS FROM 3D CAD MODEL".

How could the presence or absence of a basic dimension affect what a profile tolerance controls when no basics are shown?

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Assertion:

Since basic dimensions for distances of zero, or angles of zero or any increment of 90°, do not need to be shown, and especially since specifications per Y14.41 will show no basic dimensions, the presence or absence of basic dimensions should not affect which geometric characteristics (form, size, orientation, or location) are controlled by profile tolerances.

Problem for Industry:

Many people view Y14.5 as specifying that the presence or absence of basic dimensions does affect the control provided by a profile tolerance. This is largely due to the inclusion of figures that combine profile and ± tolerances.

This ambiguity creates confusion and therefore expense for industry.

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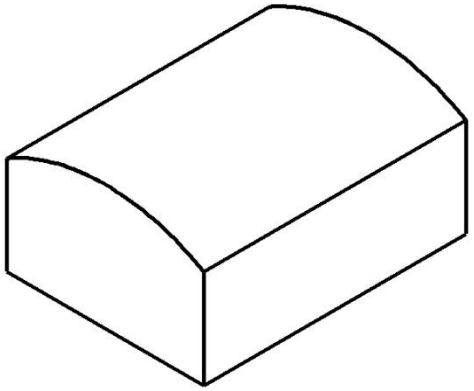
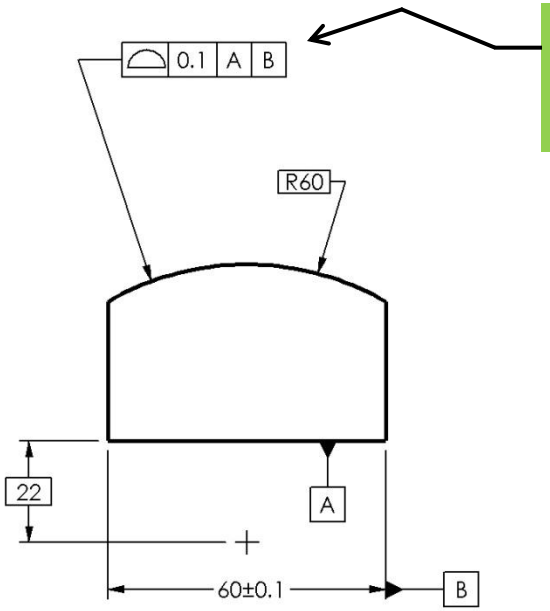
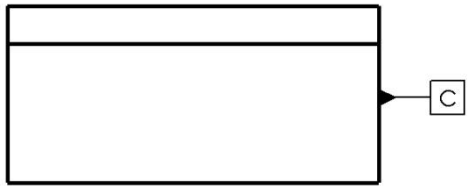
Some Better Methods:



If the 22 mm basic dimension were left off then the drawing would be incomplete.



This profile call-out controls location, orientation, and form.



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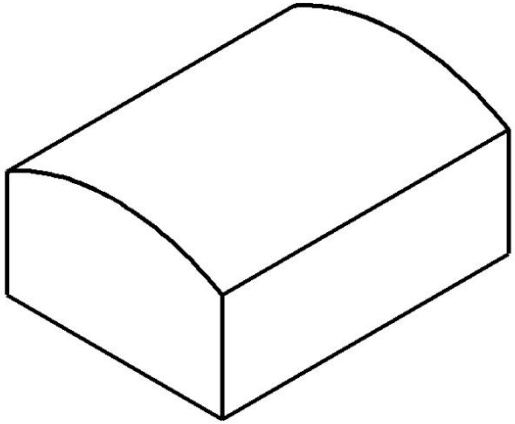
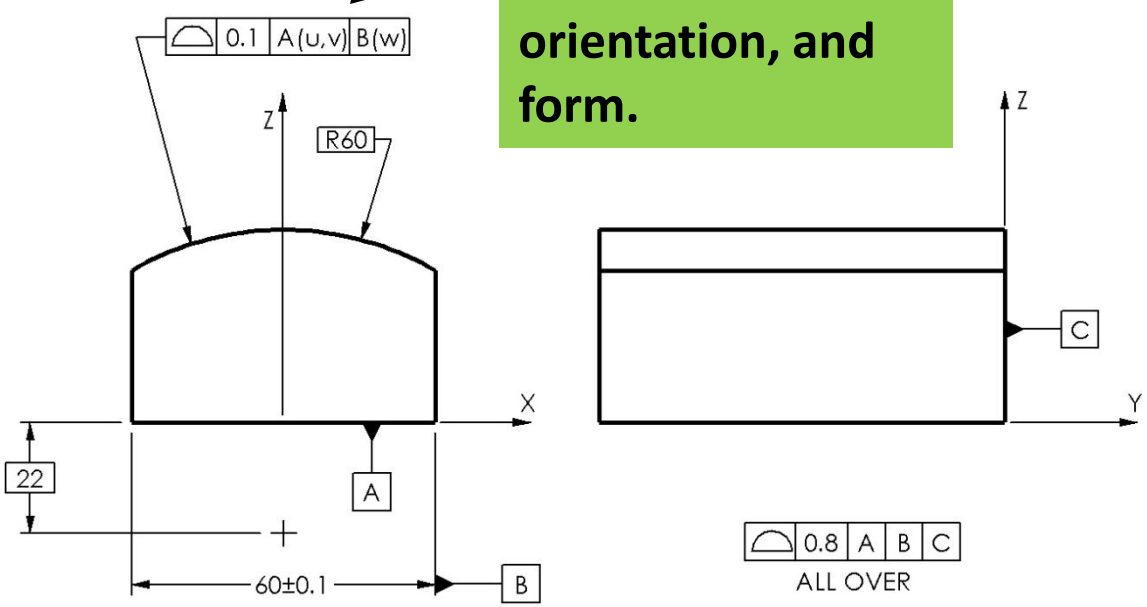
Some Better Methods:



The "ALL OVER" profile controls location of the feature.

This profile call-out controls orientation, and form.



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