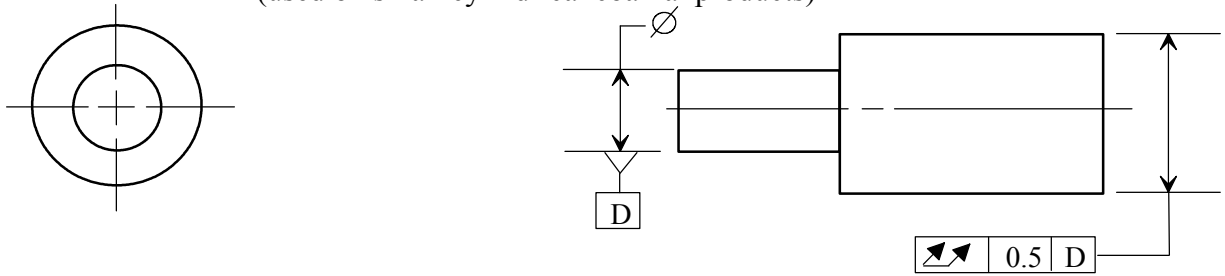


# Geometrical Dimensioning & Tolerancing

## Total Runout

(used on small cylindrical coaxial products)

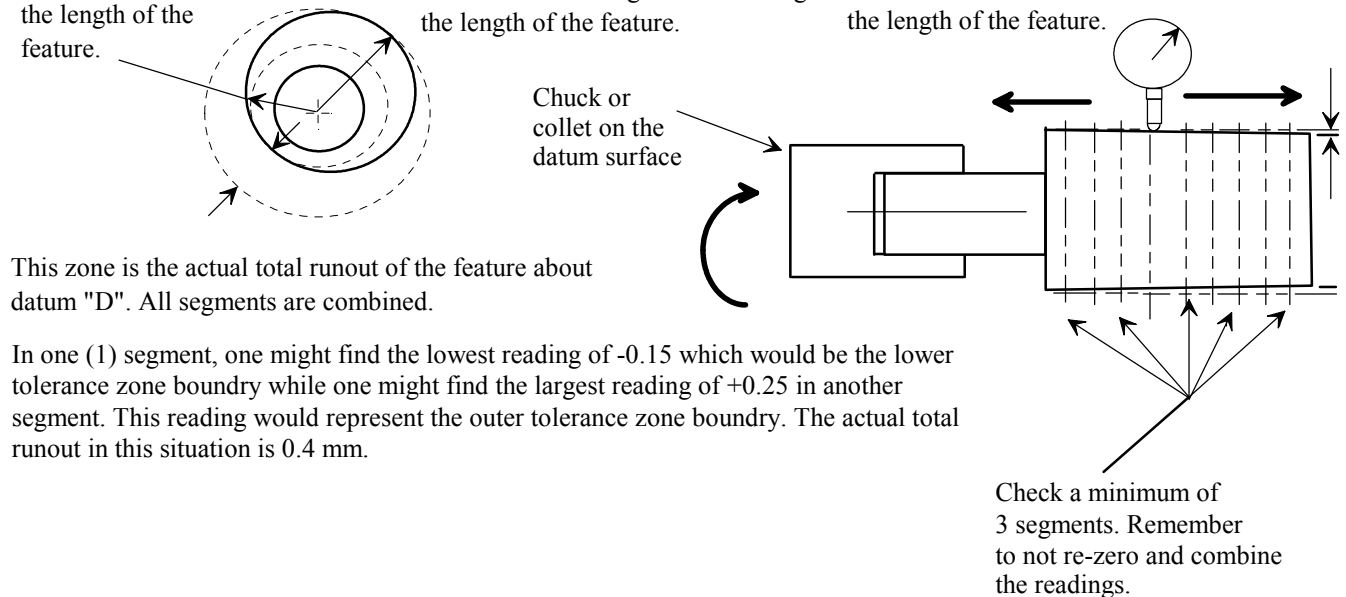


## Meaning

This is the tolerance zone about datum "D" at its smallest radius along the length of the feature.

This is the tolerance zone about datum "D" at its largest radius along the length of the feature.

Total runout combines roundness, off centre & size distortion along the length of the feature.



This zone is the actual total runout of the feature about datum "D". All segments are combined.

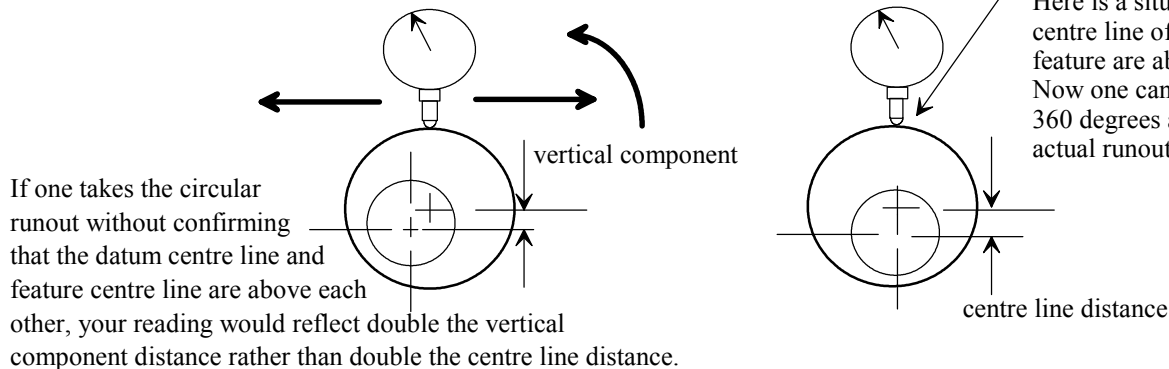
In one (1) segment, one might find the lowest reading of -0.15 which would be the lower tolerance zone boundary while one might find the largest reading of +0.25 in another segment. This reading would represent the outer tolerance zone boundary. The actual total runout in this situation is 0.4 mm.

Always move the dial indicator across the top of the circumference of the feature. The highest point is the centre line of the feature.

Rotate part until the dial indicator reads the highest point. This is the point where the centre line of the datum and the feature are above each other.

use a spherical contact to better confirm roundness

Here is a situation where the centre line of the datum and feature are above each other. Now one can rotate the part 360 degrees and reflect the actual runout at the segment.



If one takes the circular runout without confirming that the datum centre line and feature centre line are above each other, your reading would reflect double the vertical component distance rather than double the centre line distance.

The total runout is twice the centre line distance from the feature to datum combined with the roundness of the feature, size distortion and straightness along the length of the feature. It does reflect the shape of the feature along its length!!!