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Ra & Rz: Communication is Key

Everyone will agree that open lines of communication with your customers is key to running a successful business, and nowhere is that more evident than in setting expectations before a job even begins.

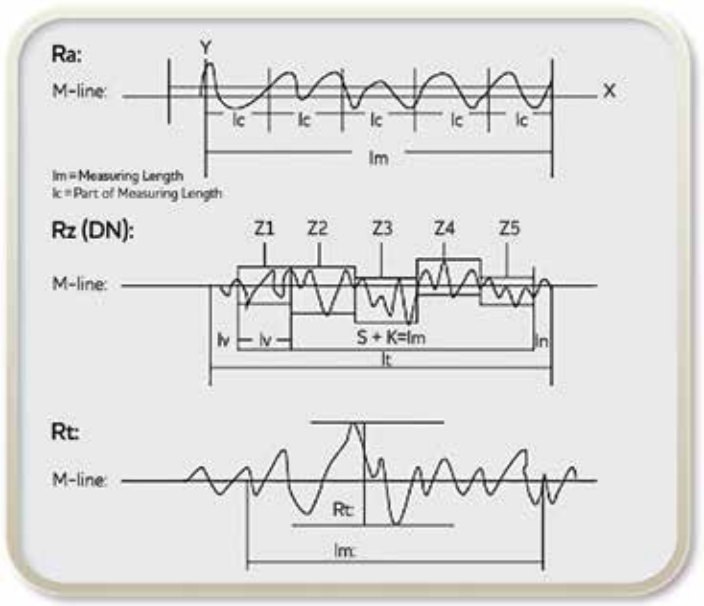
And Ra versus Rz as a measurement proves it.

To review: Ra stands for average roughness, and it is the most commonly used criterion in North America.

"Ra is calculated by an algorithm that measures the average length between the peaks and valleys and the deviation from the mean line on the entire surface within the sampling length. Ra averages all peaks and valleys of the roughness profile and then neutralizes the few outlying points so that the extreme points have no significant impact on the final results."
– *Modern Machine Shop*
short.productionmachining.com/RaToRz

Rz is "mean roughness step," and it is a more common measurement parameter in Europe. Again from *Modern Machine Shop*, "Rz is calculated by measuring the vertical distance from the highest peak to the lowest valley within five sampling lengths, then averaging these distances. Rz averages only the five highest peaks and the five deepest valleys—therefore extremes have a much greater influence on the final value."

To create even more confusion, the Rz calculation has changed over the years, resulting in three different calculations.



And converting from Ra to Rz and vice versa has no established ratio, either. Values range from 4-to-1, up to 20-to-1 and can be further influenced by the part's shape.

So, with all these variations, not only in the part, but in the measurement criterion, what's a part maker to do? Establish both your criteria and the customers up front, know what their measuring method and equipment will be and agree on any conversion ratios well beforehand. Last, communicate throughout the production process so that at the end of the project, they're happy, and you're paid.

For more info, read up on this topic here:
short.productionmachining.com/RaRzDiff