

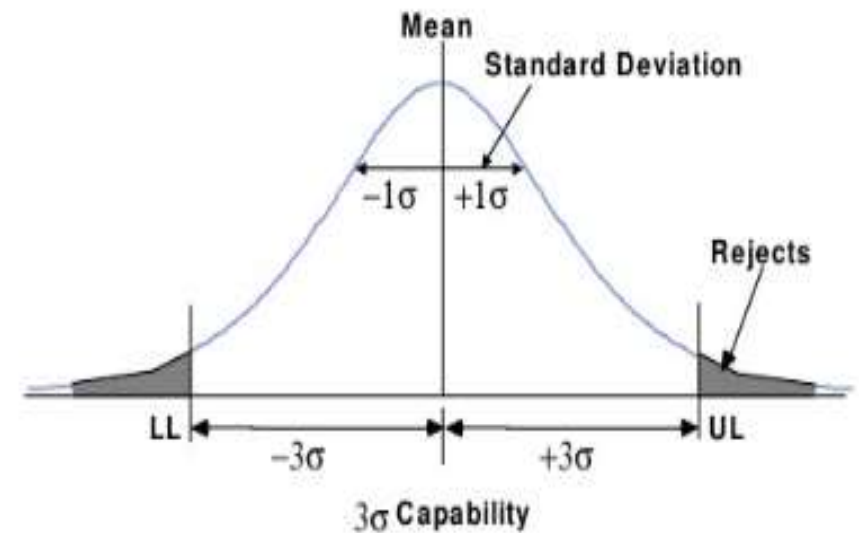


SIX SIGMA AND PROCESS TOLERANCE

K.M.Eazhil
Assistant Professor
Department of Mechanical Engineering
SNS College of Engineering
Coimbatore

PROCESS TOLERANCE

- A value that sets the standard by which the capability of your process is determined
- It is defined as a multiple of a process standard deviation (sigma)
- Usually, 6*sigma is used as a tolerance



WHAT IS SIX SIGMA TOLERANCE SPECIFICATION?

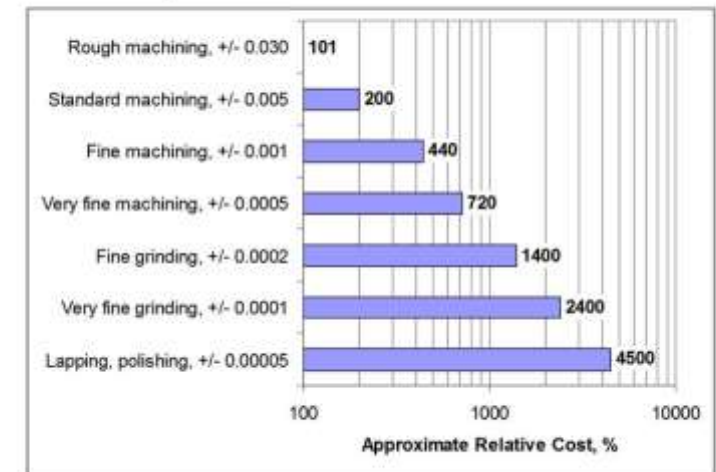
- Six Sigma tolerance specification represents the acceptable range of performance values that a customer will accept
- "Six Sigma" is a statistical term that indicates that in a batch of identically manufactured parts, 99.99966% of the items are within the acceptable tolerance specified by the customer



COST VS. TOLERANCE SPECIFICATION

- In a Six Sigma environment, less than 3.4 articles out of one million will fall out of the range of acceptable values
- Decreasing the tolerance keeps only the products that approach perfection, but creates a bigger pile of rejects
- Increasing the tolerance lets more items be shipped, but takes the risk of disappointing the customer

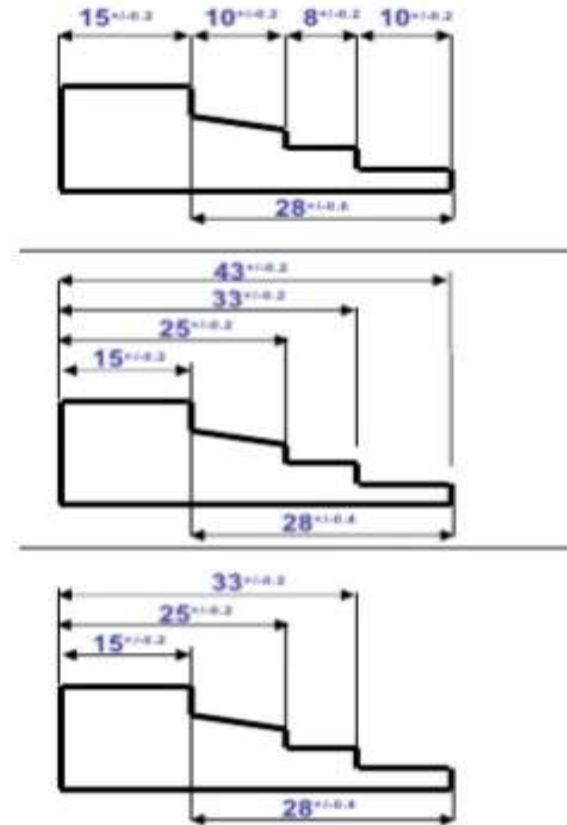
Approximate Relative Cost of Progressively Tighter Dimensional Tolerances



N.E.Woldman, Machinability and Machining of Metals Surface Finish → 9

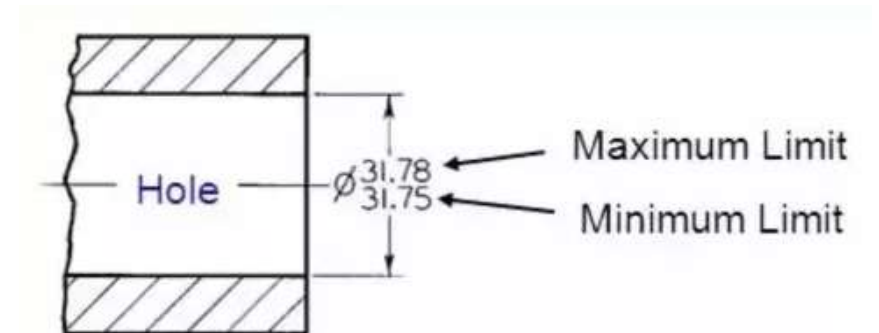
CUMULATIVE PROPERTIES OF TOLERANCE

- The variations observed in a manufactured product find roots in the slight differences introduced by each step of assembly
- Deviations, even invisible ones, tend to partially if not fully add to subsequent variations in the product
- Hence, to ensure that the product meets the requirements 99.99966% of the time, each individual step must adhere to even tighter tolerance specifications



FROM DESIGN TOLERANCE TO PROCESS TOLERANCE

- This is not about the product but all about the process," would be a way to summarize the Six Sigma perspective
- The variability observed in a product reflects the degrees of freedom that process steps introduce into an item
- Hence, the effort of designing a product performing within tolerance specifications translates into the design of an assembly process that must operate within pre-defined process tolerances, stresses





ASSESSMENT

The role of management is to

- a) provide Resources
- b) define EMS
- c) monitor the effectiveness of the system
- d) All of the above



THANK YOU