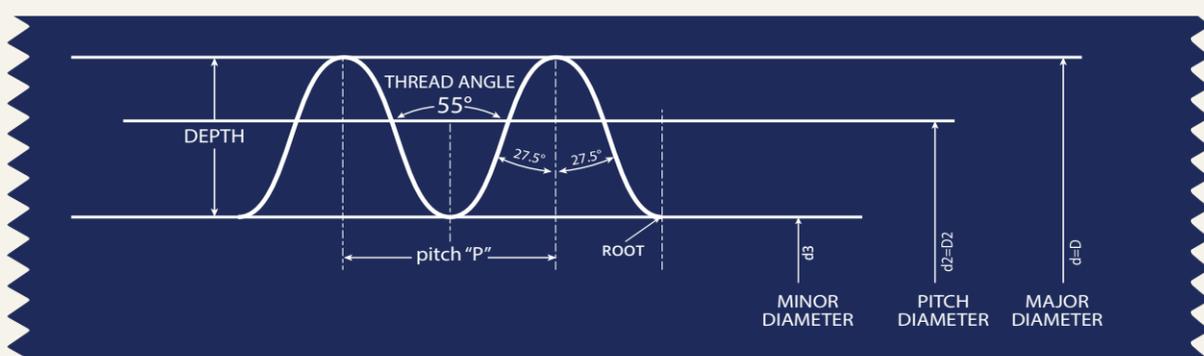


CONSISTENT THREAD GEOMETRY

Why Some Methods Just Won't Cut It.

What is Thread Geometry?

Every thread on a bolt or screw is characterized by its geometric dimensions such as pitch, depth, angle, and diameter (major/minor). A design engineer typically chooses these dimensions based on factors such as operating environment, loads transferred, material, and industry standards. The part's accuracy to these dimensions is critical.



Why Consistency Matters

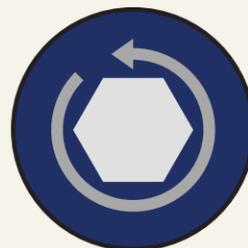
The mechanical efficiency of threaded parts depends largely on accurate and consistent internal/external thread engagement. Geometric inconsistencies can cause thread misalignment that may lead to stripping, premature failure, and expensive repairs.



MISALIGNMENT



SEIZING



FAILURE

Applications



CHEMICAL



OIL & GAS



MASS PRODUCTION



NUCLEAR



MEDICAL



AIRCRAFT/AEROSPACE

HIGH-PRECISION ASSEMBLIES

(nuclear, aircraft, medical)
Thread geometry can be so critical that inspection of the pitch and associated dimensions are required following production.

HAZARDOUS LOCATIONS

(chemical processing, oil & gas)
Thread accuracy and consistency improve safety of personnel and prevent leaking of hazardous and expensive chemicals.

INTERCHANGEABLE PARTS

In many commercial applications, if a fastener requires substitution, the replacement part must meet the number of threads per inch and designated pitch and diameter sizes of the original.

MASS PRODUCTION

Large-quantity threading can be meticulous, especially when accuracy and consistency are required. To prevent inconsistencies and boost efficiency, continuous machining processes are preferred in these applications.



DID YOU KNOW?

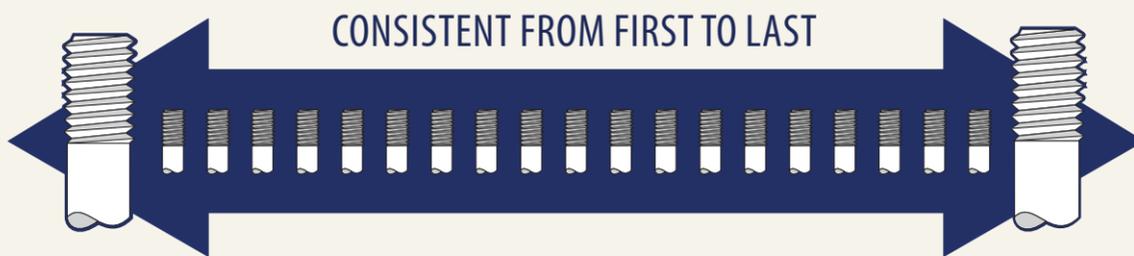
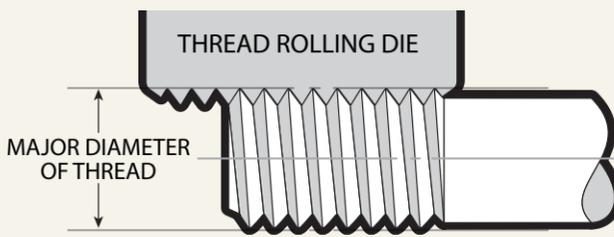
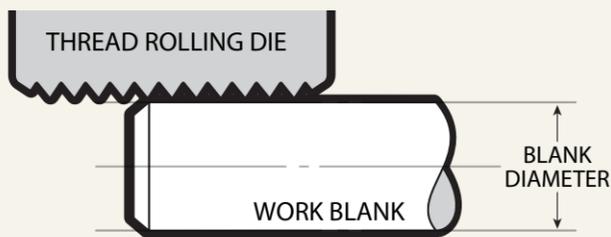
Of the 6 million components found in a Boeing 747, about half are fasteners.

Machining Specification to Improve Consistency

Factors that can affect thread consistency include poor tool quality, calibration inaccuracy, and machining process. Specifying the machining process of rolling over cutting is an effective option a designer can choose to achieve geometric accuracy and consistency.

- 1. Thread Cutting** is a subtractive process that removes material from the work piece using a sharpened cutting tool.
- Thread geometry changes during production
 - Thread-cutting tools wear down and require periodic sharpening
 - Sharpening slows down production, driving up labor costs

- 2. Thread Rolling** is a cold-working process that forces material outward using hardened steel dies.
- Highly-consistent process
 - Dies are precision-ground in hardened steel with no sharp cutting edges to wear down
 - Production is continuous, fast, and cost-effective
 - The first part is as precise as the last



What's the Next Step?

1. **DETERMINE** the importance of thread consistency in your application.
2. **SPEAK** to your machining partner about their rolling capabilities.
3. **SUBMIT** specs to **Vallorbs** for competitive pricing AND a free cost-saving machining analysis.