

(Mitutoyo)

A Brief History of the Micrometer Part 1: The Early Period

Dating back more than 5000 years to the construction of Egypt's ancient pyramids, the concept of measurement has evolved to become the foundation of modern industrial progress.

First Attempt to Measure Length with Threads

While screw threads were commonly used to raise water in ancient Greece, their capacity for measurement was overlooked until the 17th century when English astronomer W. Gascoigne first used them to measure the distance between stars. Although he did not measure the objects directly, Gascoigne's method was based on an approach similar to modern principles.

Watt's Tabletop Micrometer

More than a century later, James Watt – inventor of the steam engine – developed the first benchtop micrometer. His concept was based on a rack-and-pinion mechanism connected to rotating threads with a measuring blade attached. Thread movement was gauged through a pair of graduated disks, with the larger indicating thread revolutions and the smaller indicating fractions of an inch. The large dial face provided readings as small as 1/10000 of an inch.

At a time when most devices were large, cumbersome and difficult to operate, the concept of a benchtop machine was unique. Watt was also the first to introduce a “U”-shaped frame, now the standard for modern micrometer design. Unfortunately, Watt's invention would not become widely accepted for many years.

“Lord Chancellor” by the Father of Machine Tools

Invented in early 19th century London, Sir Henry Maudslay's screw-cutting lathe is considered the origin of all modern machine tools. Second only to Leonardo da Vinci in his field, Maudslay also designed a machine to mass manufacture pulleys used with ships, created the concept of a modern machine shop, and aided in the design of surface grinders and milling machines.

With his invention of a tabletop micrometer – called “Lord Chancellor” – Maudslay developed the most precise instrument of his time. Approximately 40cm long, the four-legged brass device featured two blocks used to hold objects. Beneath its saddle was an opening with 1/10000 inch gradations to its edge. The Lord Chancellor was so precise that, when retested again in 1918, it was still found to be accurate.

The First Commercial Measuring Machine

Mainly limited to private use until the latter 19th century, it was the invention of Sir Joseph Whitworth's “millionth of an inch” (0.254µm) measuring machine that brought precision measurement to the public eye. One of the most remarkable instruments ever designed, this 1.8 meter long Whitworth measurement device is displayed today at the Mitutoyo Museum in Kawasaki, Japan.

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