

Development of Utility Type CNC Slim Lathe Series

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1 . Introduction

In the manufacturing field, high-precision and miniaturization have aggressively been pursued as pressing requirements for many components of automobiles, electric appliances and medical equipment, but machine tools used to machine such components remain large in size. In this context, there is a growing demand for “miniaturization of machine tools to fit the sizes of workpieces” with a view to improvements in saving space and energy in machine shops.

We have developed slim CNC lathes which can machine workpieces to an equivalent degree to conventional machine tools, and can also be adapted to automatic carrying-in-and-out system of workpieces. Figure 1 shows an overview of the developed slim lathes.



Fig.1 Overview of slim lathe series

2 . Characteristics of slim lathes

There are three kinds of slim lathe - “USL-300” of 300mm in width, “USL-480” of 480mm in width, and “XW-30” of 1,000mm in width and 1,500mm in height. “XW-30” has two-parallel spindles in the machine as a concept of adapting two “USL-480”. Figure 2 shows outline of machine structures.

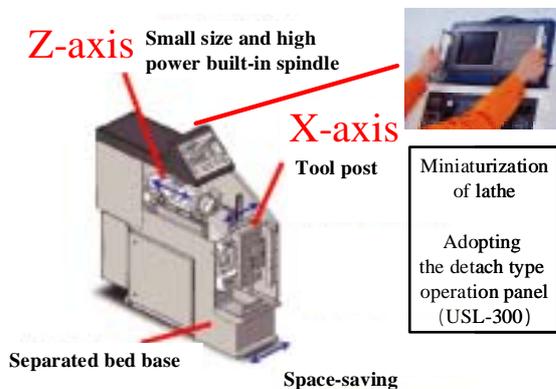


Fig.2 Outline of machine structures (ex. USL-300)

Because of miniaturizing of machine, these slim lathes have orthogonal arrangement of X and Z-axial slides. The spindle is arranged on the upper surface of the bed to move back-and-forward direction of the machine (Z-axis). A tandem type tool post is arranged on the vertical side of the machine to move horizontal direction of the machine (X-axis).The spindle is optimized selection of inertia and built-in motor power.

3 . Effects on space and energy savings

Figure 3 shows a comparison of areas occupied by a couple of two lathes.

Compared with the area occupied by conventional lathes, “USL-300” has been reduced by 80%, and “XW-30” has been reduced by 70%.

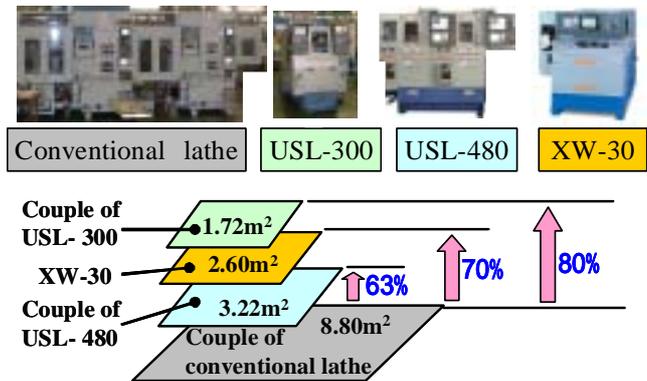


Fig.3 Effects on space savings (areas occupied by a couple of two lathes)

We have compared electric power consumptions by case of operating machines, using the same lathe sets as in Fig.3. Compared with the electric power consumed by conventional lathes, “USL-480” has been reduced by 64%, and “XW-30” has been reduced by 74%.

4 . Market share

Three kinds of slim lathe have been sold for 200 machines to the domestic major parts maker mainly, in December, 2010. Moreover, these have been exported for 40 machines. Especially, “XW-30” has been sold well because of the efficiency of space saving and high speed machining.

We will keep making an effort to improve the specification and the function of slim lathes in the future.