



Machine Tool Design (v. 1)

By Nicholas Lisitsyn, Alexander Gavryusin

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This is the first volume of a four volume set.

This fundamental four-volume work was translated from the considerably revised second edition. It should be of great value to engineers engaged in the design, manufacture and maintenance of machine tool equipment. It can also be used to advantage by the students of engineering institutes majoring in Process Engineering, Metal-Cutting Machine Tools or Cutting Tool Design.

The first volume deals with the basic machine tools and special machine tools used in cutting tool production. The classification, type and size range, and designation of machine tools, employed in Soviet practice, are given in detail, together with the types of motion found in machine tools. Metal-cutting lathes, turret lathes, vertical boring machines, automatic and semiautomatic lathes, milling machines and many other types of machine tools are described. Special attention has been given to machine tools designed for the production of cutting tools. These include general and single-purpose semiautomatic precision thread-grinding machines, automatic and semiautomatic tracer-controlled lathes with hydraulic controls, jig boring machines and specialized machine tools, as well as automatic transfer machines for cutting tool production.

Volume two contains Parts Three and Four. Part Three deals with the kinematics of machine tools. This branch of machine tool design has been strictly systematized by the author and is set forth with exceptional clarity. The kinematic structures of a great many different types of machine tools, including the most complex gear-cutting machines, are analyzed by methods developed in the text which take into consideration the interrelation between the workpiece to be produced in the given machine tool. Part Four takes up hydraulic drives of machine tools. It contains all the theoretical and practical data required in the application of fluid power and control systems to machine tools.

Volume Three contains Part Five and this deals with machine tool design proper. It is a comprehensive scientific treatment of the subject and is a revised and complemented version of a previous Russian edition which has become a reliable reference book for all Soviet machine tool engineers and has been translated into French. Such questions as performance criteria, basic design data, principal specifications and the development of the kinematic scheme of a new machine

tool are dealt with in great detail. Design recommendations are given as well as the necessary calculation data for the basic elements of machine tools - speed and feed gearboxes, stepless drives, rapid traverse mechanisms, spindles and spindle bearings, mechanisms for rectilinear motion, small displacement and periodic motion, reversing devices, beds columns, tables and other housing-type components, slideways and antifriction ways.

The fourth and final volume covers Automatic Machine Tools and Transfer Machines, and Machine Tool Testing and Research, Parts Six and Seven of the complete work. Part Six deals with the fundamental principles of machine tool automation, the various systems of numerical programme control that have found extensive application in modern machine tool design in the USSR and other countries. Much space has been given to automatic transfer machines, including in-line, rotary, and other types, their layout, features, design procedures, structure, and output.

Current methods of testing and investigating the geometrical, kinematic, dynamic, and operational characteristics of machine tools are considered in Part Seven. Methods of testing the quality characteristics, of determining the corresponding criteria (indices), and of using contemporary apparatus for this purpose are dealt with. --This text refers to the Paperback edition.

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Machine Tool Design (v. 1) By Nicholas Lisitsyn, Alexander Gavryusin Bibliography

- Rank: #15852191 in Books
- Color: Blue
- Published on: 2000-04
- Original language: English
- Number of items: 1
- Dimensions: 9.00" h x 7.25" w x 1.50" l, 2.28 pounds
- Binding: Paperback
- 604 pages

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