

**COMPUTER AIDED PLANNING  
OF GRINDING OPERATIONS FOR  
FERROUS COMPONENTS**

*by*

**RUPINDER GUPTA**

Department of Applied Mechanics

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requirement for the degree of*  
**DOCTOR OF PHILOSOPHY**



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## CERTIFICATE

This is to certify that the thesis titled **Computer Aided Planning of Grinding Operations for Ferrous Components**, being submitted by Mr. Rupinder Gupta to the Indian Institute of Technology, Delhi, for the award of Degree of Doctor of Philosophy, is a record of bonafide research work carried out by him. He has worked under my guidance and supervision and has fulfilled the requirements for the thesis, which to my knowledge, has reached the requisite standard.

The results contained in this thesis have not been submitted in part or full to any other university or institute for the award of Degree or Diploma.



Dr. K.S. Shishodia  
Associate Professor  
Dept. of Applied Mechanics,  
Indian Institute of Technology,  
New Delhi (India) - 110 016

## DECLARATION

I, RUPINDER GUPTA, hereby declare that the entire work embodied in this thesis has been carried out by me and no part of it has been submitted for any degree or Diploma of any institution previously.

A handwritten signature in black ink, appearing to read 'Rupinder Gupta', written in a cursive style.

(Rupinder Gupta)

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(Rupinder Gupta)

## ABSTRACT

Grinding is a complex process and its planning depends upon the experience and expertise of the shop floor engineers. Knowledge about the process and its planning rests with the practitioners of the art.

The overall exponential increase in the manufacturing activity in the recent years has led to a situation of acute dearth of expert process planners. To solve this problem, efforts are being made to automate the planning process such that the knowledge and experience of several process planners are included in a computer program. The program may then be used by many organizations for process planning. Such systems are called expert systems.

The present work is devoted to the development of computer software for proper selection of grinding parameters. A knowledge based expert system approach has been adopted for designing the software.

Whereas the traditional operation planning ends with the recommendation of a viable set of process parameters, the computerized operation planning can be far reaching. For example it can examine the temperature distribution in the workpiece and whether thermal burning of the workpiece is likely to occur or not. Optimization of the process parameters is also possible. All these aspects are considered in the present investigation.

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