

GUIDELINES
FOR
PREPARATION OF
THESIS/DISSERTATION
FOR
M.TECH



KURUKSHETRA UNIVERSITY
KURUKSHETRA - 136119

GENERAL INFORMATION

PREAMBLE

While utmost attention must be paid to the content of the thesis/ dissertation (here-in-after called the 'thesis'), which is being submitted in partial fulfillment of the requirements of the respective degree, it is imperative that a standard format be prescribed. Write up of the thesis shall be prepared in M.S. word/Latex. The same format shall also be followed in preparation of the final soft and hard copies to be submitted to the Department and Library in future. While writing the thesis care must be taken that **no short forms should be used in the thesis such as Expt, Temp., Eqⁿ, deg., Pr. etc. in the text.** The thesis is required to be submitted before 14th August, after which the student will be required to deposit late fees of thesis submission as per Kurukshetra University rules. Students are expected to publish two research papers related to his/her thesis work in reputed/refereed journals with ISSN number or any reputed conference.

1. ORGANIZATION OF THE THESIS/ DISSERTATION/ REPORT

The thesis shall be organized in a number of chapters, starting with Introduction and ending with Conclusions. Each of the other chapters will have a precise title reflecting the contents of the chapter. A chapter can be subdivided into *sections, subsections and sub-subsections* so as to present the content discretely and with due emphasis.

When the work comprises two or more mutually independent investigations, the thesis may be divided into two or more parts, each with an appropriate title. However, the numbering of chapters will be continuous right through, for example Part 1 may comprise Chapters 2-4, Part Two, Chapters 5-7.

1.1 Introduction

The title of **Chapter 1** shall be INTRODUCTION. It shall justify and highlight the problem posed, define the topic and explain the aim and scope of the work presented in the thesis. It may also state the motivation for the present work and highlight the significant contributions from the investigation. The organization of the thesis shall be given briefly highlighting the contents of the various chapters.

1.2 Review of Literature

This shall normally form Chapter 2 and shall present a critical appraisal of the previous work published in the literature pertaining to the topic of the investigation. The extent and emphasis of the chapter shall depend on the nature of the investigation. Based on the exhaustive review, gaps shall be identified and the objectives for the present work shall be formulated.

1.3 Report on the present investigation

The reporting on the investigation shall be presented in one or more chapters with appropriate chapter titles.

- Due importance shall be given to experimental setups, procedures adopted, techniques developed, methodologies developed and adopted.
- While important derivations/formulae should normally be presented in the text of these chapters, extensive and long treatments, copious details and tedious information, detailed results in tabular and graphical forms may be presented separately in Appendices. Representative data in table and figures may, however, be included in appropriate chapters.
- Figures and tables should be presented immediately following their first mention in the text. Short tables and figures (say, less than half the writing area of the page) should be presented within the text, while large tables and figures may be presented on separate pages, however the text will continue on the previous page and no space shall be left blank.
- Equations should be written using Microsoft Equations and should form separate lines with appropriate paragraph separation of 6 points above and below the equation line, with equation numbers flushed to the right. Equation number of all the Equations should be chapter wise, for ex. (3.1) represents the first equation in chapter 3. The number of Equations should follow right alignment.

In general following chapters may be included:

1.3.1 Problem Formulation and Analysis

The problem formulation is the heart or core of the thesis. The problem may be defined in just one sentence, but it should make it clear to everyone what is the research problem

which is aimed to be addressed in the thesis and to whom and where it is relevant. Any mathematical equations and analysis of the problem shall also be discussed in this chapter. Units used in the thesis should be SI units.

1.3.2 Experimental Setup and Procedure/Solution Procedure

This chapter shall describe the experimental setup fabricated and the procedure used to carry out the experimentation. If the dissertation is based on some software or program, then the algorithm used shall be described. The validation of the model used may be given in this chapter. Any program or software made shall be submitted with source code in the CD/DVD form along with the thesis. This source code and the program/software shall be submitted to the concerned supervisor and shall be the copyright of the university/institute.

1.4 Results and Discussion

This shall form the penultimate chapter of the thesis and shall include a thorough evaluation of the investigation carried out and shall bring out the contributions from the study. The discussion shall logically lead to inferences and conclusions along with the illustrations about the outcomes and benefits of the research as well as scope for possible further future work.

1.5 Conclusions

This will be the final chapter of the thesis. A brief report of the work carried out shall form the first part of the Chapter. Conclusions derived from the logical analysis presented in the Results and Discussions chapter shall be presented and clearly enumerated, each point stated separately. Scope for future work should be stated lucidly in the last part of the chapter.

1.6 Literature Cited

The list of references should follow the Conclusions chapter with references listed sequentially as they appear in the text of the thesis. If pertinent works have been consulted but not specifically cited, they should be listed as Bibliography and should be

mentioned in the last. Spacing and font size should be consistent inside a single reference, and there should be paragraph spacing of 12 pt before and after between two different references. The font size and line spacing of each reference shall follow the format of original write-up. The reference format for different category of references is given in the end.

1.7 Appendix

Appendix should be at the end of thesis. Detailed information, lengthy derivations, raw experimental observations, computer programs, algorithms of methods etc. are to be presented in the separate appendices, which shall be numbered in Roman Capitals (e.g. “Appendix III”). It generally includes Computer Programs, Certificate from the Company, Algorithms, Derivations, Process Sheets, Standard Data used for Thesis, Standard Codes used and Questionnaire/Tools etc.

1.8 Publications by Candidate

Articles, technical notes etc. on the topic of the thesis published by the candidate may be separately listed after the literature cited. This may also be included in the contents. The candidates may also include reprints of his/her publications after the literature citation.

2. THESIS FORMAT

2.1 Paper

2.1.1 Quality

The thesis shall be printed/ xeroxed on white bond paper, whiteness 95% or above, weight 80 gram or more per square meter.

2.1.2 Size

The size of the paper shall be standard A4; height 297 mm, width 210 mm.

2.2 Type Setting, Text Processing and Printing

The text shall be printed employing laser jet or Inkjet printer, the text having been processed using a standard text processor. The standard font shall be **Times New Roman of 12 pts with 1.5 line spacing or equivalent in Latex.**

2.3 Margins

The candidates shall have to take single sided printing with left margin 1.25", right, top and bottom margins as 1".

2.3 Header (Optional)

The header must have the Chapter number and Section number (e.g., Chapter 2, Section 3) on even numbered page headers. Chapter title or Section title may be given on the odd numbered page header.

2.4 Paragraph format

The first line of each paragraph should not be indented and should start from the margin. Single line spacing should be left after each paragraph ends, in between or when a new heading starts. The heading shall be given a paragraph spacing of 6 pts before and after. A paragraph should normally comprise more than one line. A single line of a paragraph shall not be left at the top or bottom of a page (i.e., no windows or orphans should be left).

2.5 Pagination

Page numbering in the text of the thesis shall be Hindu Arabic numerals at the center of the footer. But when the candidate opts for header style the page number shall appear at the right and left top corner for the odd and even number pages, respectively. The pagination should start with the first page of Chapter 1 and should continue throughout the text (including references and appendices). The subsequent chapters shall begin on a fresh page. When header style is chosen the first page of each chapter will not have the header and the page number shall be printed at the center of the footer.

Pagination for pages before the Introduction chapter shall be in lower case Roman numerals, e.g., “iv”.

2.6 Chapter and Section Format

2.6.1 Chapter

Each chapter shall begin on a fresh page and Chapter number (in Hindu Arabic) and title shall be printed at the center of the line in 14 pt font size in bold face using upper case. A single line gap shall be left between the Chapter number and Chapter title line and two blank lines between chapter title line and the first paragraph. Sample copy of the ‘Introduction’ chapter is given on page 18.

2.6.2 Sections and Subsections

A chapter can be divided into Sections, Subsections and Sub-subsections so as to present different concepts separately. Sections and subsections can be numbered using decimal points, e.g. 2.2 for the second section in Chapter 2 and 2.3.4 for the fourth Subsection in third Section of Chapter 2. The Section, Subsection and sub-subsections titles along with their numbers in 12 pt font, in bold face shall be flushed to the left (not centered). Chapters, Sections, Subsections and Sub-subsections shall be included in the Contents with page numbers flushed to the right.

SECTION TITLES: Upper Case and Bold Letters (12 pt) Ex. 2.1

Sub-Section Titles: Lower Case (with first letter capital) and Bold Letters (12 pt) Ex. 2.1.1

Sub-Subsection Titles: Lower Case Italics (with first letter capital) and Bold Letters (12 pt) Ex. 2.1.1.1

However, for the titles of subsections and sub-sub sections, the first letter of prepositions, conjunctions and articles such as **and, to, for, of, the** (if it comes in between), **with, on** etc. shall not be capitalized.

2.6.3. Table / Figure Format

As far as possible, tables and figures should be presented in portrait style. Small size tables and figures (less than half of writing area of a page) should be incorporated within the text, while larger ones may be presented on separate pages. In such a case, the text will continue after the reference of table or figure and no blank spaces will be left. Table and figures shall be numbered chapter wise. For example, the fourth figure in chapter 5 will bear the number Figure 5.4. Similar numbering shall be used for tables.

The tables and figures along with their captions and numbers in 12pt font, in bold face shall be centered (not flushed to the left). Table number and title will be placed above the table while the figure number and caption will be located below the figure. Reference for Table and Figures reproduced from elsewhere shall be cited in the last and separate line in the table and figure caption, e.g. (after Belusko [12]). Sample examples for the figure and table are given on page 19 and 20 respectively.

3. Auxiliary Format

3.1. Binding

The thesis/dissertation should be hard bound in black color and not spiral bound or soft bound.

3.2. Front, Back and Side Covers

The front cover shall contain the following details:

- Full title of thesis in 16 pt size font (bold) properly centered and positioned at a distance of 1" from the top.
- Name of the course, name and roll number of candidate, and name(s) of supervisor(s) in 12 to 14 pt size bold should be written at the center of the front cover page.
- University emblem/logo of minimum 1.2" size followed by name of department, name of institute, name of university, place and year of submission; each in a separate line and properly centered should be placed at a distance of 1" from the bottom.

- The side cover shall contain the following details: Name of the degree along with name of the thesis and candidate's name and year of submission is to be provided at the closed side of the bounded book.
- The back cover however shall remain blank.

3.3 Lettering in Front Cover and Side Cover

All lettering shall be embossed in gold.

3.3. Blank Sheets

In addition to the white sheets (binding requirement) two white sheets shall be put at the beginning and the end of the thesis (on each).

3.4 Number of Copies

Total **four** copies of thesis shall be prepared which will be distributed as

Department library	: 1 copy
HOD (To be given to external examiner)	: 1 copy
Supervisors (s)	: 1 copy each
Student to retain	: 1 copy

Along with the hard copies of the thesis, student is required to give soft copy of the thesis in PDF format on a CD/ DVD. They have to be given in a closed pocket in the back cover page of the thesis submitted. All the CDs and DVDs must have a label each indicating the name of the thesis, name of student and the date of submission. It should be borne in mind that their formats may become obsolete due to rapid change in technology, making it impossible for the Departmental Library to guarantee their preservation and use.

3.5 Title Sheet

This shall be the first printed page of the thesis and shall contain the submission statement: the Thesis/Dissertation submitted in partial fulfillment of the requirements of the Degree, M.Tech, the name and Roll No. of the candidate, name(s) of the Supervisor

and Co-supervisor (s) (if any), Department, Institute and year of submission. Sample copy of the 'Title Sheet' is shown on page 12.

3.6 Declaration of Academic Honesty and Integrity

A declaration of Academic honesty and integrity is required to be included along with every thesis/dissertation/report after the title sheet. This shall form the page i of the auxiliary sheets. The format of this declaration is given on page 13.

3.7 Certificate

A certificate is obtained from supervisor/supervisor (s) is to be enclosed. The format of the certificate is given in pages 14 and 15.

3.8 Acknowledgements

The acknowledgments by the candidate shall follow the certificate, signed by him/her, with date. The student shall express his gratitude to all concerned directly or indirectly who helped him/her in the completion of the thesis. For example, the supervisor, Director, Faculty Incharge, Faculty, Non teaching and supportive staff, friends and family.

3.13. Abstract

The thesis should contain an abstract of approx 300-500 words (about one page). The abstract shall highlight the important features of the thesis/ dissertation. Primarily, the abstract should present the aim, methodology used and important conclusions reported. The Abstract in the thesis, shall have 4-5 key words in the end.

3.10. Contents

The contents shall enlist the titles of the chapters, sections, subsections and sub-subsection using decimal notation, as in the text, with corresponding page number against them, flushed to the right. The sample copy of the contents is given on page 16-17.

3.11. List of Figures and List of Tables

Two separate lists of Figure captions and Table titles along with their numbers and corresponding page numbers against them shall follow the Contents. After that the list of symbols as used in the thesis is to be given.

3.12. Abbreviation Notation and Nomenclature

A complete and comprehensive list of all abbreviations, notations and nomenclature including Greek alphabets with subscripts and superscripts shall be provided alphabetically after the list of tables and figures. The alphanumeric symbols will be given first, followed by Greek symbols. Any abbreviation appearing for the first time in thesis shall be first given in full form with the abbreviation in bracket. For example, Non Destructive Testing (NDT). The first letter of the words will be capital. (As far as possible, generally accepted symbols and notations should be used). If the abbreviations used in the thesis are in a good number, a separate sheet may be used; otherwise they may be given at the end in nomenclature.

Auxiliary pages from declaration to nomenclature shall be numbered using Roman numerals in lower case, while the text starting from the Introduction shall be in Hindu Arabic. There will be no page number on the title sheet.

Sample Copy

**STUDIES ON THE SLIDING WEAR BEHAVIOR OF
HYPEREUTECTIC ALUMINIUM SILICON ALLOYS**

16 FONT
BOLD,
1.5 LINE
SPACING

A Dissertation

*Submitted in Partial Fulfillment of the
Requirements for the Award of the Degree
of*

12 FONT BOLD, ITALICS

MASTER OF TECHNOLOGY

12 BOLD

IN

BRANCH NAME

(Specialization in _____)

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SUBMITTED BY

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NAME OF STUDENT

ROLL NO

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UNDER THE SUPERVISION OF

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June, 2015

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DECLARATION

I hereby declare that the work which is being presented in the thesis, entitled “**THESIS TITLE**” for the award of the degree of Master of Technology in Branch Name with specializationis an authentic record of my own work carried out under the supervision of Dr/Mr/Mrs....., Designation, Department of, Institute Name, Kurukshetra University, Kurukshetra. The matter presented in this thesis has not been submitted by me for the award of any degree/diploma of this or any other University/Institute.

Further, I declare that where other’s ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

I hereby agree to indemnify INSTITUTE NAME and its Teaching Staff against any and all losses incurred in connection with the processing related to any claim of plagiarism and/or copyright infringement. Further, the responsibility of this act of plagiarism or infringement, if proved, will be borne solely by me.

Paste Color Photograph
Student’s Signature

Date

Student’s Name

CERTIFICATE *

This is to certify that the thesis entitled “**THESIS TITLE**” submitted by **Student’s Name, Roll No.** to the Department of of Institute Name, Kurukshetra University, Kurukshetra for the award of the Degree of Master of Technology in..... with Specialization in, is a bona fide research work carried out by him/her under my supervision and guidance. His/Her thesis has reached the standard of fulfilling the requirements of regulations relating to degree.

I wish him success in all his future endeavors.

(Supervisor’s Name)
Designation
Deptt. of.....
Institute Name

This is to certify that Mr. is a bona fide student of Master of Technology in (with the specialization in), under class Roll No. The dissertation is, in our opinion worthy for consideration for the award of Master of Technology in

(Name)
M.Tech. Coordinator
Deptt. of.....
Institute Name

(Name)
Head of Department
Deptt. of.....
Institute Name

* In case of one supervisor.

CERTIFICATE **

This is to certify that the thesis entitled “**THESIS TITLE**” submitted by **Student’s Name, Roll No.** to the Department of of Institute Name, Kurukshetra University, Kurukshetra for the award of the Degree of Master of Technology in with Specialization in, is a bona fide research work carried out by him/her under our supervision and guidance. His/Her thesis has reached the standard of fulfilling the requirements of regulations relating to degree.

We wish him success in all his future endeavors.

(Supervisor’s Name)

Designation

Deptt. of.....

Institute Name

(Co-Supervisor’s Name)

Designation

Deptt. of.....

Institute Name

This is to certify that Mr. is a bona fide student of Master of Technology in (with the specialization in), under class Roll No. The dissertation is, in our opinion worthy for consideration for the award of Master of Technology in

(Name)

M.Tech. Coordinator

Deptt. of.....

Institute Name

(Name)

Head of Department

Deptt. of.....

Institute Name

** In case of two supervisors.

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Sample Copy

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

The competition in the world market form a manufactured product has intensified tremendously in the recent years. It has become important, and vital for new product to reach the market as early as possible, before the competitors. To bring products to market swiftly, mainly of the processes involved in the designing, testing, manufacturing and marketing of the products have been squeezed, both in term of time and material resources. The efficient use of such valuable resources calls for new tools and approaches in dealing with them.

1.2 RAPID PROTOTYPE

The definition of Rapid Prototype (RP) is “a process that automatically creates a physical prototype from a 3D CAD-Model, in a short period of time”. This definition makes a much broader theory of RP possible than only focusing on RP systems that are currently available. A brief description of various techniques of rapid prototyping is given below.

1.2.1 Selective Laser Sintering

The initial development of the Selective Laser Sintering (SLS) process was done at the University of Texas in Austin by Carl Decard [1] for his master’s thesis and was patented in 1989. This layer additive process is based on the sintering or fusing of small particles by use of a high powered carbon dioxide laser.

1.2.2 3 D Printing Technology

Three – dimensional printing is a method of converting a virtual 3D model into a physical object. 3 D printers typically work by printing successive layers on top of the previous to build up a three dimensional object. Before printing a 3D model from an STL file, it must first be examined for "manifold errors", this step being called the "fixup".

ONE BLANK LINE

TWO BLANK LINES

FONT SIZE
12, BOLD

FONT SIZE
14, BOLD

12 FONT SIZE
1.5 LINE SPACING

FIGURES

Figures should be numbered at the bottom as ex. Figure 3.1, if it is the first figure appearing in Chapter 3 (along with the title)

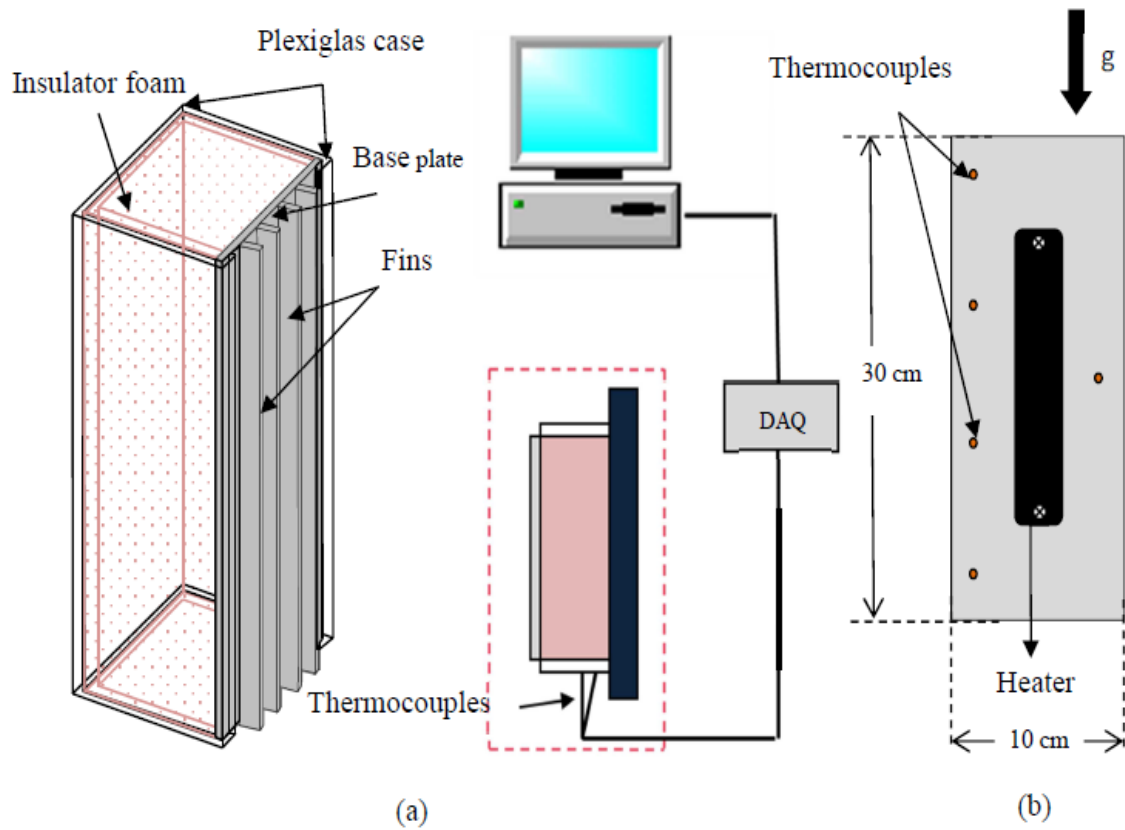


Figure 3.1: Schematic of heat sink test-bed

Different parts in the figure should be neatly labeled and should be easily readable.

TABLES

Tables should be numbered at the top as Table 3.1, if it is the first table appearing in Chapter 3 (along with the title).

Table 3.1: Material composition of heat pipe

S.No.	Part Name	Copper (%)	Aluminium (%)	Chromium (%)
1.				
2.				
3.				

REFERENCES AND BIBLIOGRAPHY

Text Citation: Within the text, references should be cited in numerical order according to their order of appearance. The numbered reference citation should be enclosed in brackets. For example, It was shown by Prusa [1] that the width of the plume decreases under these conditions.

In the case of two citations, the numbers should be separated by a comma [1, 2]. In the case the number of reference citations is more than two, the numbers should be separated by a dash [5-7].

List of References: References to original sources for cited material should be listed together at the end of the paper and footnotes should not be used for this purpose. References should be arranged in numerical order according to their order of appearance within the text.

1. Reference to journal articles and papers in serial publications should include:
 - last name of each author followed by their initials separated by ‘comma’ and ‘and’ for the last author.
 - year of publication.
 - full title of the cited article in quotes, title capitalization.
 - full name of the publication in which it appears in Italics.
 - volume number (if any) (include the abbreviation, "vol.")
 - issue number (if any) in parentheses (Do not include the abbreviation, “No.”)
 - page numbers of the cited article separated by hyphen (include “pp.”)
2. Reference to textbooks and monographs should include:
 - last name of each author followed by their initials.
 - year of publication.
 - full title of the publication in Italics.
 - Publisher.
 - city of publication.
 - page numbers of the work being cited (include “pp.”).
 - chapter number (if any) at the end of the citation following the abbreviation, “Chap.”
3. Reference to individual conference papers, papers in compiled conference proceedings, or any other collection of works by numerous authors should include:

- last name of each author followed by their initials
- year of publication
- full title of the cited paper in quotes, title capitalization
- individual paper number (if any)
- full title of the publication in italics
- initials followed by last name of editors (if any), followed by the abbreviation, “eds.”
- Publisher
- city of publication
- volume number (if any) if a single number, include, “vol.” if part of larger identifier (e.g., “PVP-vol. 254”)
- page numbers of the work being cited (include “pp.”)

4. Reference to theses and technical reports should include:

- last name of each author followed by their initials
- year of publication
- full title in quotes, title capitalization
- report number (if any)
- publisher or institution name, city

A few examples of formats of references are given below and the student should be consistent in following the style.

i. Journals

- [1] Ning, X., and Lovell, M. R., 2002, “On the Sliding Friction Characteristics of Unidirectional Continuous FRP Composites,” *ASME J. Tribology*, vol. 124(1), pp. 5-13.
- [2] Exner, H. E., 1979, “Physical and Chemical Nature of Cemented Carbides”, *International Metals Review*, vol. 24, pp. 149-173.

ii. Books

- [1] Jones, J., 2000, *Contact Mechanics*, Cambridge University Press, Cambridge, UK, Chap. 6.

iii. Conference Proceedings

- [1] Lee, Y., Korpela, S. A., and Horne, R. N., 1982, "Structure of Multi-Cellular Natural Convection in a Tall Vertical Annulus," *Proc. 7th International Heat Transfer Conference*, U. Grigul et al., eds., Hemisphere, Washington, DC, 2, pp. 221–226.
- [2] Hashish, M., 2000, "600 MPa Waterjet Technology Development," *High Pressure Technology*, PVP-Vol. 406, pp. 135-140.

iv. Thesis

- [1] Tung, C. Y., 1982, "Evaporative Heat Transfer in the Contact Line of a Mixture," Ph.D. thesis, Rensselaer Polytechnic Institute, Troy, NY.
- [2] Smith, R., 2002, "Conformal Lubricated Contact of Cylindrical Surfaces Involved in a Non-Steady Motion," Ph.D. thesis, <http://www.cas.edu/rsmith/homepage.html>

v. Technical Reports

- [1] Kwon, O. K., and Pletcher, R. H., 1981, "Prediction of the Incompressible Flow Over A Rearward-Facing Step," Technical Report No. HTL-26, CFD-4, Iowa State Univ., Ames, IA.
- [2] Zukas, E. G., Rogers, P. S. Z. and Rogers, R. S., 1976, "Experimental Evidence for Spheroid Growth Mechanisms in the Liquid Phase Sintered Tungsten Based Composites", Informal Report: Los Alamos Scientific laboratory, USA, pp. 1-35.

vi. Patents

- [1] Oenning V. and Clark, I. S. R., 1991, U. S. Patent No. 4988386.

vii. Journals in Non-English Language

- [1] Weihong L. and Xiuren, T., 1988, "Tungsten Matrix in Cu-W Contact Materials by Impregnation Process," *Powder Metallurgy Technology*, vol. 6(8), pp. 1-4 (in Chinese).
