

A Development for the Design and Manufacture of Cutter 's Profile

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ABSTRACT

This research probes into the design and the development of the machining profile on the formed milling cutter. The computer-aid automation process will take place of the conventional method. The conventional method grinds the formed cutter by means of a ready-made mold plate to profile the workpiece. Thus, the grinding machine produces a cutter identical to the mold. The disadvantage of this method is that the cutter might be ground into unexpectedly incorrect size. It results in some problems with the cutter life, the cutting capability and the vibration. This research is based on the axis-controlled machining coordinate of the multiple axis grinding machine and the program language to develop one CAD/CAM system. By means of the setting of parameter, the program code of the grinding wheel path required for machining need will be automatically produced. Deducing the already known input conditions of the grinding path, the external form of the product after machining, the coordinate system of the servo axis of the machine, the parameter of the cutter and the machining drawing of the product can be completed by any computer-aided designing software. This is the 2D sectional drawing after machining. We get the geometric coordinate values of X and Y. Then, output them to get the servo machine coordinates of X, Y, A and B of the machining machine. During the coordinate converting process, the path offset theory is needed so as to satisfy the limitation on the machining path continuation. Then, employ the cutting simulation software of the multiple NC to verify the result of analysis. This reverse process reads the program code of the grinding path produced, and simulates the actual grinding status on the profile of the formed milling cutter. According to the researched deduction, this essay is to write a computer-aided system of the machining path for independent profile cutter value. It can read the product sectional profile, and produce a NC code. Its reverse simulating result completely conforms to the parameter size and the originally designed profile of the profile cutter. In addition to providing the profile machining technology on profile cutter, this research can shorten the production cycle of the profile cutter, upgrade the quality of the profile cutter, and reduce the development and the manufacture costs. It is expected to build a machining expert system with complete automation.

Keywords : Profile Cutter ; Tool Path ; CAM

Table of Contents

封面內頁 簽名頁 授權書.....	iii	中文摘要.....	iv
iv 英文摘要.....	v	誌謝.....	vii
目錄.....	viii	圖目錄.....	xi
.....	xiv	符號說明.....	xv
.....	1	1.1 研究動機.....	1
.....	2	1.2 研究目的.....	2
.....	2	1.3 文獻回顧.....	3
.....	5	1.4 研究步驟.....	5
.....	5	1.5 論文架構.....	6
.....	6	第二章 基本理論.....	8
.....	8	2.1 銑刀之種類.....	8
.....	8	2.1.1依材料區分.....	8
.....	8	2.1.2依齒型區分.....	8
.....	8	2.1.3依加工性質區分.....	9
.....	12	2.2 銑削原理.....	12
.....	12	2.3 銑削的形式.....	14
.....	16	第三章 型刀設計與空間座標轉換推導.....	16
.....	16	3.1 座標定義.....	16
.....	16	3.2 建立型刀空間模型.....	17
.....	18	3.3 座標轉換推導.....	18
.....	18	3.4 刀具加工路徑偏置.....	30
.....	30	3.4.1直線之偏置生成.....	30
.....	30	3.4.2圓弧之偏置生成.....	31
.....	30	3.4.3消除幾何位置之不連續.....	31
.....	32	第四章 電腦輔助製造程式建構.....	35
.....	35	4.1 Visual Studio.Net 2003介紹.....	35
.....	35	4.2 設計流程.....	37
.....	37	4.3 刀具加工程序及程式介面.....	37
.....	41	4.4 數值加工碼解析.....	41
.....	41	4.5 結果分析與討論.....	42
.....	43	4.5.1粗加工.....	43
.....	43	4.5.2精加工.....	45
.....	45	第五章 電腦輔助加工模擬.....	47
.....	47	5.1 AlphaCUT簡介.....	47
.....	47	5.2 機台規劃.....	47
.....	48	5.3 機台參數設定.....	50
.....	50	5.4 範例模擬.....	50
.....	53	第六章 結論與展望.....	62
.....	62	6.1 結論.....	62
.....	62	6.2 未來展望.....	64
.....	64	參考文獻.....	65

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