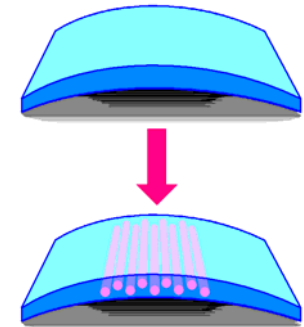
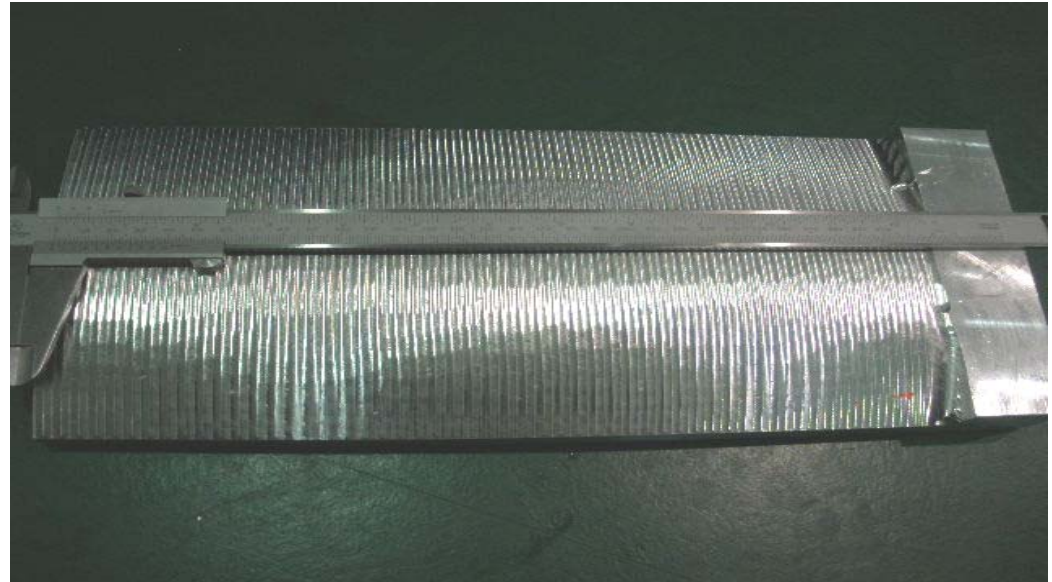


Finished Parts / 工藝樣本

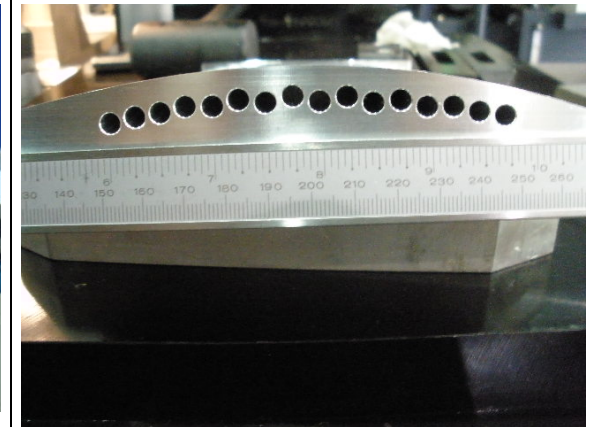
Date: Oct 2, 2010

Ref No.:

Workpiece	工件名稱	Turbine Blad 引擎葉片
Material	材質	AL 7050 forging 鍛造鋁材
Machine	使用機型	FW-1000
Drilling dia.	鑽孔孔徑	Ø5.02mm Ø7.22mm
Drilling depth	鑽孔深度	350mm
Machining time	加工時間	75min
Depth to depth ratio	深度孔徑比	70 times



Process illustration



Key Points / 加工特點說明

The part is aircraft engine blade with small holes in close pitch, the hole length/diameter ratio (L/d) is 70 times. By normal machines, drill center runs out while L/d reaches 20 times, it happens that 2 holes drilled from both side cannot connect or parts damaged by drill over run-out. WeiHong FW gundrill performs excellent precision and efficiency along with the professional application.

Wei Hong knowledgeable advise:

- It takes higher velocity to cut AL7075 (forging). \varnothing 5.02mm drill has less rigidity, so proper high spindle speed is important to avoid vibration.
- Proper thickness of remaining while primary rough cut influence the stability of drill and less run out.
- Burnishing tool is recommended. Choose type A with chip-breaking slot, instead of type G, to control less friction area and least thermal.
- Coolant with low stickiness provide better chip remove capability for AL materials.

本工件為航空器發動機的引擎葉片,孔徑小且孔間距厚度薄,孔長徑比將近 70 倍,使用一般的加工機或鑽孔機,入刀位置準確,但在深度超過 20 倍之後,孔位明顯偏移,導致兩端孔無法相接,或出現過大偏曲導致鑽破材料的情形發生,並無法達到所需的精度。威鴻 FW 系列槍鑽機搭配正確的切削液,以及切削數據與特殊的加工方式,成功且有效的取得最佳的精度與加工效率。

威鴻專業應用技術部門的加工技術展現:

- 加工 7075 鋁材(鍛造)所需的合理線速度較高,由於 ψ 5.02 小鑽頭本身剛性較差,在轉速高時,刀具容易抖動,加工精度掌控嚴苛.
- 工件在粗加工後所預留的精加工量、孔壁與材料剩餘厚度需留意,過多或過少都將出現後續精加工不穩定的孔位偏移現象(通常是往薄的一端偏移)。威鴻反覆測試得到最佳預留量參數!
- 刀具需選擇適合的滾光模式,而非一般泛用型的滾光 G 型造成摩擦面積過大與熱度升高,導致孔位的偏曲度難以掌控。此工件加工使用 A 型滾光,且鑽頭修磨角度也較大,並製作斷屑槽。
- 切削液之選擇需選擇黏度較低,流動性較高,且針對鋁材加工所調製的切削液。