Judgement Guide CNC-Milling-07

《数控铣项目主观评价指南》

Jürg Marti CE-07 WSC Kazan / Russia

喀山世界技能大赛 07 数控铣项目首席专家 马蒂

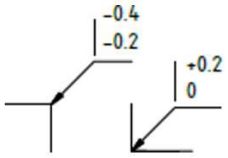
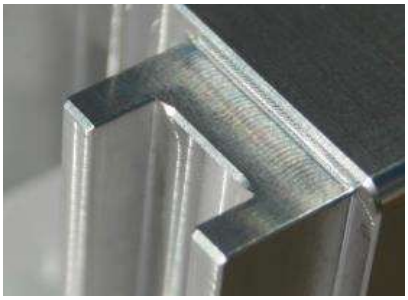
05.03.2019

List of Contents 目录

	评判项目		页码
1	Chamfering edges by machine; side 1, 2, 3, 4	机床倒角 面1、2、3、4	3
2	Chamfering edges by hand; side 1, 2, 3, 4	手工倒角, 面1、2、3、4	4
3	Lead in / out marks / scratches	进退刀痕迹/划痕划伤	5
4	Chatter marks; side 1, 2, 3, 4	振纹 面1、2、3、4	6
5	Mismatch; side 1, 2, 3, 4	接刀（出现的台阶） 面1、2、3、4	7
6	File / Deburr damage; side 1, 2, 3, 4	锉削/去毛刺造成的挫伤或划伤, 面1、2、3、4	8
7	Collision and contour damage; side 1, 2, 3, 4	碰撞及轮廓损伤 面1、2、3、4	9
8	Swarf marks	垫屑产生的痕迹	10
9	Thread milling	螺纹铣削	11

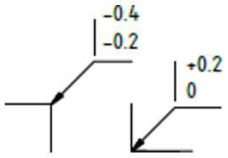
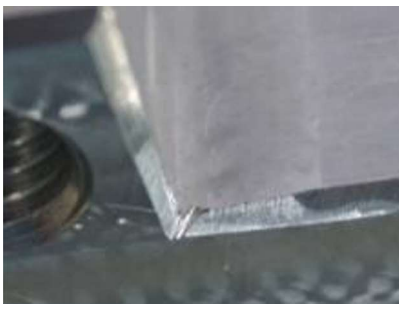
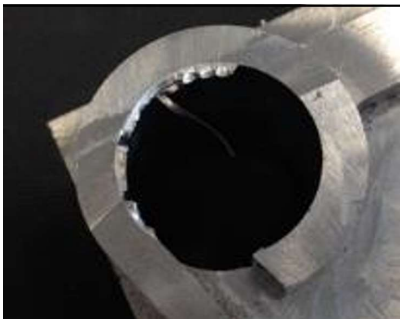
1

Chamfering edges by machine; side 1, 2, 3, 4
机床倒角，面1、2、3、4

Judgment score 分值	Description: 描述 As drawing specification 与图纸相符性	
3	Perfect! All edges within defined limits. There is no room left for 90° chamfering cutter to the closest edge. 完美. 所有边缘在可接受范围. 没有90度倒角刀在边缘倒角的遗漏	
2	1–2 mm more in length would be possible at the edges. 距边缘 1-2mm 区域未完成倒角.	
1	Chamfering by machine is different in length and 2 mm or more would be possible from the closest edge. 机倒角大小不一致，并且距相邻边缘（障碍台阶边缘）2mm 或以上区域未完成机倒.	
0	3 or more machine chamfering are missing or sharp edges. Machine chamfering not attempted. 三处或以上机倒角遗漏或出现尖锐边缘. 机倒角未完成.	

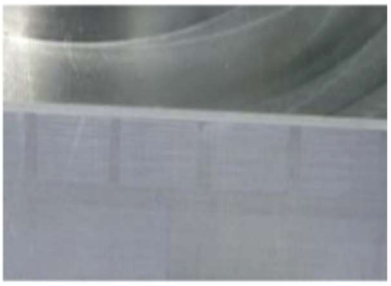
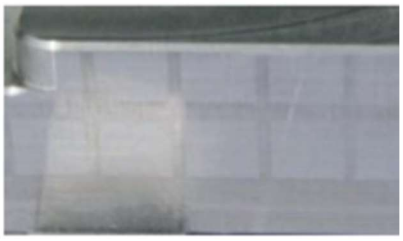
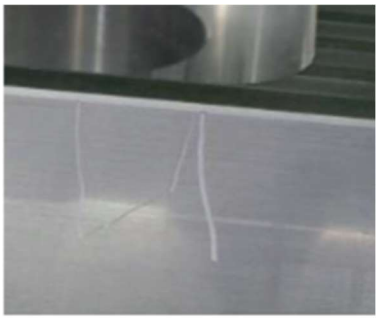
2

Chamfering edges by hand; side 1, 2, 3, 4
手工倒角，面1、2、3、4

Judgment score 分值	Description: 描述 As drawing specification 与图纸相符性	
3	Perfect! Perfect! All edges within defined limits in drawing. There is no room left for chamfering by hand tools. 完美 所有边缘在可接受范围内 无手工倒角遗漏	
2	1–2 mm more in length would be possible at the edges. Hand chamfering isn’ t too small or too large 距（障碍）边缘1-2mm区域未完成手工倒角，手倒不会太大或太小.	
1	Chamfering by hand is different in length and angle. 2 mm or more would be possible at the edges. 手工倒角大小或角度不一致 距（障碍）边缘2mm或以上未完成倒角.	
0	Chamfering by hand tools is not attempted, regardless how small or heavy burrs on the module 手工倒角未完成 不论毛刺是大还是小.	

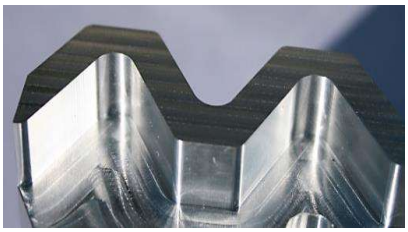
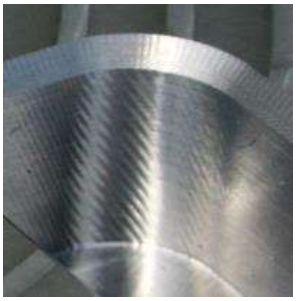
3

Lead in / out marks / scratches
进退刀痕迹/划痕刮伤

Judgment score 分值	Description: 描述 Marks from clamping-process in machine vice 虎钳夹持位移导致的痕迹	
3	Perfect! No visible marks or scratches, except marks from measuring tools such as micrometer 完美 无可见痕迹或划痕刮伤 千分尺等量具测量产生的痕迹不算	
2	Vaguely visible marks from machine vice. No scratches, except marks from measuring tools such as micrometer 模糊可见的虎钳夹持痕迹 无划痕. 千分尺等量具测量产生的痕迹不算.	
1	Vaguely visible marks with minor scratches 模糊可见的小痕迹或刮伤	
0	Clearly visible marks with scratches 视觉可见的清晰划痕刮伤	

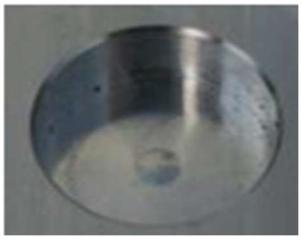
4

Chatter marks; side 1, 2, 3, 4
振纹，面1、2、3、4

Judgment score 分值	Description: 描述 Chatter marks including chamfering chatter marks 振纹包括倒角（过渡圆角）时产生的振痕	
3	Perfect! No visible marks from cutters in radiuses and lines. All edges and radiuses look the same as contouring. 完美 圆弧或直线均无痕迹 所有边缘及圆弧均与轮廓看起来一致.	
2	1 slight chatter mark per side 每条边（面）有一处轻微的振纹.	
1	2 or more visible chatter marks per side 每条边有两处或以上明显的振纹.	
0	Serious chatter marks per side 每条边都有严重振纹	

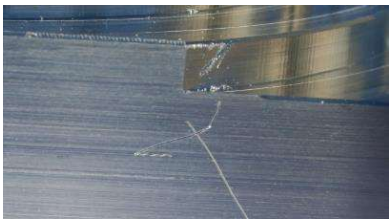
5

Mismatch; side 1, 2, 3, 4
接刀（出现的台阶），面1、2、3、4

Judgment score 分值	Description: 描述 As drawing specification from side 1 to 2, 3, 4 依照图纸上每个面1、2、3、4面	
3	Perfect! No visible and no marks can be felt with finger nail. 无可见台阶的（接刀）痕迹. 手指刮过也不会感觉到台阶痕迹.	
2	1 slight discrepancy between each machining side or machining features, practically invisible from the eye but can be felt with the finger nail. 加工面或特征之间有1处轻微不符，视觉不可见，但手指可以感触到	
1	Visible discrepancies per machining side or machining features. Visible with the eye and clearly noticeable feel with the fingernail. No more than 2 discrepancies per module 加工面或特征之间有可见的不符。视觉可见而且手指能明显感触到。每个模块不超过2处不符	
0	Wrong side as drawing specification, or increased convex. Not required features on the surface.Clearly visible distance from the eye between each machining side or machining features. 该面与图纸要求不符或多了凸台. 在工件表面出现了未要求的特征.每个加工面或特征之间有清晰可见的距离	

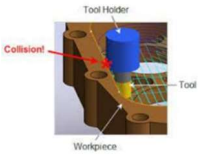
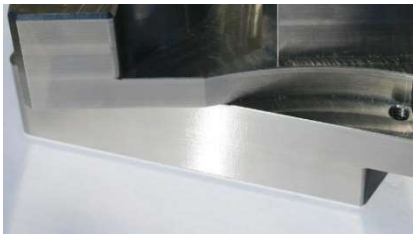
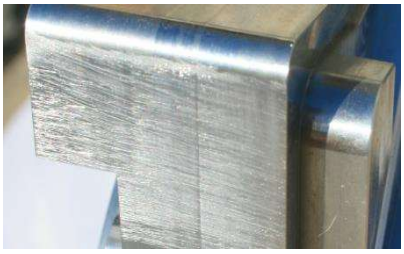
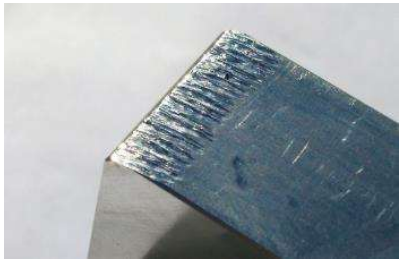
6

File / Deburr damage; side 1, 2, 3, 4
锉削/去毛刺造成的损伤（挫伤或划伤），面1、2、3、4

Judgment score 分值	Description: 描述 Deburring damage by hand tools 手工去毛刺产生的损伤	
3	Perfect! No visible marks from hand tools. No transition from machining to deburring by hand tools. 完美 无手工去毛刺痕迹 无机床与手工倒角过渡产生的痕迹	
2	1 slight scratch on the whole module with hand tools or 1 slightly groove at the edge 手工去毛刺产生了一处轻微的擦伤 （整个工件）,或边缘处有1处出现轻微的凹槽.	
1	2 – 3 slight scratches on the whole module with hand tools or deburring is insufficient 整个模块因手动工具而产生2-3处轻微划痕或者去毛刺不充分	
0	Serious scratches or no deburring with hand tools. Sharp edges 明显划痕,或无手工去毛刺, 出现尖锐的边缘.	

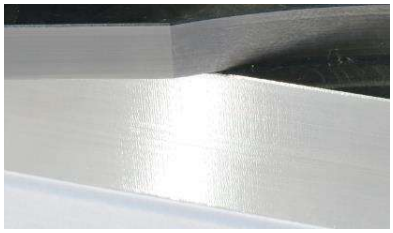
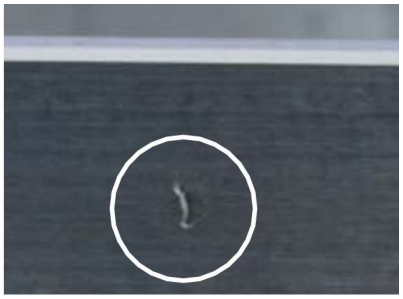
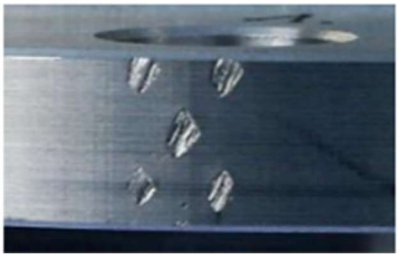
7

Collision and contour damage; side 1, 2, 3, 4
碰撞及轮廓损伤，面1、2、3、4

Judgment score 分值	Description: 描述 Collisions with cutting tools , arbors and visual contour damage 切削刀具刀杆或刀柄碰撞及可见的轮廓损伤 	
3	Perfect! Module is visually excellent. No scratches from lead-in – lead-out process. No crash marks or contour damage. 完美，看起来无懈可击. 无进、退刀过程产生的痕迹 无撞伤或轮廓损伤	
2	Slight relocation traces while machining. No rip out traces. 轻微的错位造成的加工痕迹 无撕裂（断裂）的痕迹	
1	Rip out traces. Module has no contour damage or crash marks but slight clamp imprints or more than two scratches. 有撕裂（断裂）痕迹. 工件无轮廓损伤或撞痕，但有轻微夹痕或多于2处的划痕刮伤	
0	Collision with cutting tools, regardless to what extent 切削刀具产生了碰撞，无论是什么样的程度	

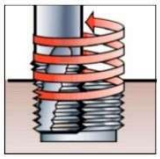
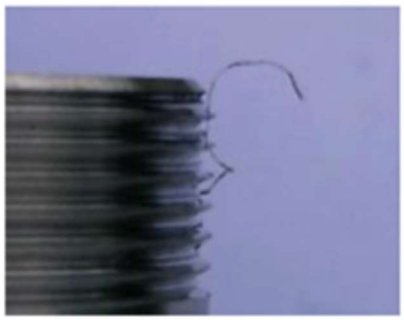
8

Swarf marks
垫屑产生的痕迹

Judgment score 分值	Description: 描述 Swarf marks from machine vice or handling 来自虎钳或手工的切屑痕迹	
3	Perfect! No visible swarf marks from tightening on the whole module 完美 整个工件无可见的切屑痕迹	
2	1 slight swarf mark on the whole module of max 1 mm diameter 整个工件有1处轻微的切屑痕迹，且伤痕最大直径尺寸是1mm.	
1	2 or more visible swarf marks 2处或以上可见的切屑垫屑痕迹	
0	Serious swarf marks, rip-out marks 出现严重的切屑垫屑痕迹，或严重的拉伤痕迹	

9

Thread milling
螺纹铣削

Judgment score 分值	Description: 描述 Conformity to drawing 与图纸相符性 	
3	Perfect! Gauge has no leeway. Gauge testing is running smooth 完美 检测规转动顺畅 通规与螺纹间无缝隙	
2	Gauge testing is running smooth. Chamfering is too large or too small. 检测规转动顺畅 但倒角太大或太小.	
1	Swarf or burr, but gauge is running stiff or with some force 有伤痕或毛刺,但通规可以僵硬（艰难不顺畅）或用力的转动（旋入）.	
0	No thread milling. Gauge is not running or is too large with heavy leeway 无螺纹. 通规不能转动或与螺纹间留有过大空间缝隙	