Simplified DFM Analysis Report

Base Information	Part Number ： GMS38294 Part Material : CARBIDE Process Designation ： CIM FINALES	
Process Description	Mould	CIM (Ceramic Injection Molding):Carbide Powder +binder injection to produce green parts,following by debinding ,sintering ,and finishing
	Post- Processing	FINALES finishing ,including Mark DETAIL (Engraving /identification marking)
	Material Properties	High hardness and high brittleness， difficulty to machine ,prone to edge chipping and corner breakage
DFM Risk Analysis	Material-Related	1High brittleness of carbide ,no fillets /radii specified on the drawing ,sharp edges prone to chipping during sintering /machining
		Low green strength in CIM :Large wall thickness variation leads to sintering deformation /cracking
		High Grinding cost :unnecessary complex surfaces significantly increase machining time
	CIM Mould	No draft angle specified :green parts prone to drag marks and material shortage during demolding
		Fine engrave markings maybe incompletely filled during sintering ,overly small fonts tend to blur .
		Thin-wall structures (wall thickness＜0.5mm)are prone to breakage during debinding
		Carbide can only be processed by grinding /EDM,not conventional milling

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		Deep narrow slots and small holes have extremely low machining efficiency with high tool wear
		Sharp internal corners can not be fully cleared by grinding ,leaving dead zones
DFM IMPROVEMENT RECOMMENDATIONS	Structural Optimization	Add R0.2~R0.5 fillets /radii to all internal/external sharp corners to prevent sintering edge chipping and grinding stress cracks
		Add 1°~3° draft angles to all vertical faces to suit CIM molding
		Uniform wall thickness with variation ≤0.3mm to avoid sintering deformation
	Marking Optimization	Engraving depth ≥0.15mm,line width ≥0.2mm to prevent blurring after sintering
		Place markings on flat surfaces ,avoiding edges corners ,and curved areas
	Machining Optimization	Eliminate extremely small deep slots and micro-hole features ,simplify contours to reduce grinding operations
		Prefer through-holes,limit blind hole depth to within 3xhole diameter
	Drawing Completion	Add dimension tolerances and sintering shrinkage compensation allowances
		Specify surface roughness and marking legibility acceptance criteria
		Define unified standards for chamfer /fillets radii
Summary	THIS PARTS UTILIZE CIM+FINISHING process with carbide material .The current drawing lacks critical manufacturing features including fillets /radii,draft angles ,and wall thickness control ,presenting risks of demolding damage ,sintering cracks ,and excessive finishing costs .implementing the DFM optimization measures above will reduce scrap rated ,shorten production cycles ,and effectively control overall manufacturing costs	

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