

**SKILLS FRAMEWORK FOR PRECISION ENGINEERING
TECHNICAL SKILLS AND COMPETENCIES (TSC) REFERENCE DOCUMENT**

TSC Category	Precision Manufacturing Process					
TSC	Injection Mould Design					
TSC Description	Design moulds for manufacturing of products through plastic injection moulding processes					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
			PRE-DES-3037-1.1	PRE-DES-4037-1.1		
			Design plastic injection moulds, using computer-aided design (CAD) software, to meet polymer-based product manufacturing requirements	Manage and optimise injection moulding processes by applying design for manufacturing principles in mould design, selection of injection mould machines and material selection		
Knowledge			<ul style="list-style-type: none"> • CAD engineering practices in three-dimensional (3D) mould design • Mould design concepts • Types of mould temperature control methods • Types of mould parting lines, gates and ejections • Mould shrinkage factors and calculations • Calculations for mould cavities and associated types of mould layouts • Mould assembly views and their objectives • Classifications and quantification of mould components • Types of mould materials and their processing • Methods of constructing tandem moulds • Features of micro moulds and liquid silicone rubber moulds 	<ul style="list-style-type: none"> • Applications of mould design software • Types of plastic materials and their characteristics • Design for manufacture concepts • Mould design calculations • Three-dimensional (3D) mould designs • Injection moulding processes and optimisation 		

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<p>Abilities</p>			<ul style="list-style-type: none"> • Define parting lines, gates and ejections for part models • Apply mould shrinkage to part models • Determine number of cavities and cavity layout for moulds, to meet manufacturing requirements • Use CAD applications to design injection moulds for plastics parts • Verify designs against mould design review checklists to ensure quality • Select and construct mould bases, components, mould plates and insert materials • Design mould temperature control methods • Generate general assembly drawings • Complete bill of materials for mould assembly 	<ul style="list-style-type: none"> • Determine suitable plastic materials for manufacturing products based on requirements • Design and model plastic products, according to specifications • Determine number of cavities, mould layouts and runner systems to meet manufacturing requirements • Determine sizing of mould inserts, mould bases and parting surfaces • Design moulds, assembly and detailed drawings to manage engineering projects in mould design • Evaluate and perform mould set-ups and trial runs • Review product designs to improve moulding tool productivity • Identify improvements in moulding tool designs to reduce costs 		
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