

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

TSC Category	Precision Manufacturing Process					
TSC	Polymeric Additive Manufacturing					
TSC Description	Evaluate potential applications of additive manufacturing with a specialised emphasis on polymeric product manufacturing					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
				PRE-MPR-4039-1.1	PRE-MPR-5039-1.1	
				Review solid-based polymeric additive manufacturing (AM) processes to determine their suitability for manufacturing polymeric components	Review liquid-based polymeric additive manufacturing (AM) processes to determine their suitability for manufacturing polymeric components	
Knowledge				<ul style="list-style-type: none"> Principles of precision engineering Fundamentals of solid-based polymeric AM processes and applications Strengths and limitations of solid-based polymeric AM techniques Polymeric material characterisation Solid-based polymeric AM product performance Applications and operational parameters of selective laser sintering (SLS) machines Applications and operational parameters of powder bed and inkjet head three-dimensional (3D) printing machines Applications and operational parameters of fused deposition modelling (FDM) machines Post-processing of solid-based polymeric AM products and their equipment 	<ul style="list-style-type: none"> Principles of precision engineering Fundamentals of liquid-based polymeric AM techniques, processes and applications Material characterisation and analyses Applications and operational parameters of stereolithography (SLA) machines Applications and operational parameters of three-dimensional (3D) polymer jetting machines Applications and operational parameters of fused filament fabrication machines Applications and operational parameters of 3D bioprinting machines Product performance, strengths and limitations of liquid-based polymeric AM Post-processing of liquid-based polymeric AM products and their equipment 	

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<p>Abilities</p>				<ul style="list-style-type: none"> • Review methodologies for solid-based AM of polymeric components for effectiveness in meeting requirements • Analyse materials to determine considerations for polymeric components to be manufactured via AM • Evaluate viability of using various equipment and processes for solid-based polymeric AM • Plan and determine processes and procedures for manufacturing polymeric components using AM • Plan and determine post-processing procedures for manufacturing polymeric components using AM • Assess the value-add of solid-based polymeric AM for component manufacturing, compared to traditional precision manufacturing processes • Identify and act on possible concerns of using solid-based polymeric AM as a new manufacturing technique • Obtain buy-ins and seek endorsement on plans to use solid-based polymeric AM for manufacturing components 	<ul style="list-style-type: none"> • Review methodologies for liquid-based polymeric AM of components for effectiveness in meeting requirements • Analyse and determine the physical and chemical property requirements of components • Analyse and determine appropriate AM materials and recipes, based on component property requirements • Evaluate viability of using various equipment and processes for liquid-based polymeric AM • Plan and determine processes and procedures for manufacturing polymeric components • Plan and determine post-processing procedures for manufacturing polymeric components • Assess the value-add of liquid-based AM for component manufacturing, compared to other additive manufacturing processes for meeting component requirements • Identify and act on possible concerns of using liquid-based polymeric AM as a new manufacturing technique • Obtain buy-ins and seek endorsement on plans to use liquid-based polymeric AM for manufacturing components 	
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