

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

TSC Category	Precision Manufacturing Process					
TSC	Product and Machine Assembly					
TSC Description	Utilise component preparation, assembly and troubleshooting techniques to assemble manufacturing equipment, end-products and sub-components					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	PRE-OPR-1062-1.1	PRE-OPR-2062-1.1	PRE-OPR-3062-1.1			
	Assemble manufactured products, using tools and workshop machines with appropriate assembly techniques	Assemble drive mechanisms in machine tools used in manufacturing processes	Assemble industrial machinery and equipment, employing techniques in machine components preparation, assembly and trouble-shooting			
Knowledge	<ul style="list-style-type: none"> Types of assembly tasks and methods Types of visual and function checks Types and uses of tools, instruments and materials for assembly Handling of materials Procedures for handling worn, faulty and/or unsafe tools and instruments Tool cleaning methods and cleaning agents 	<ul style="list-style-type: none"> Concept of linear motion guides Methods for assembling linear motion guides Methods for checking surface smoothness of linear motion guides Procedures for lubricating linear motion guides Methods for assembling different types of bearings to machine tools Methods of assembling ball screw assemblies Methods of pre-loading spacers in wire cut machines Methods for performing pre-tensioning, using spacers 	<ul style="list-style-type: none"> Machine configurations Interpretation of mechanical drawings Types of general and specific machines, associated capacities and mechanical components Planning and organisation of machine assembly sequences Applications of measuring devices and alignment equipment and devices Procedures for actions against non-conformance of components Applications of fastening components to assembly, geometric dimensioning and tolerancing (GD&T), limits and fits Datum alignment and tests Assembly tuning Unit critical functional tests Types of quality control tests for machines 			
Abilities	<ul style="list-style-type: none"> Wear appropriate personal protective 	<ul style="list-style-type: none"> Assemble linear motion guide components according to safe working 	<ul style="list-style-type: none"> Identify machine assembly requirements in 			

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	<p>equipment (PPE) and/or cleanroom garments</p> <ul style="list-style-type: none"> • Prepare tools, instruments and materials, and set up work areas in accordance with types of tasks to be performed • Perform product assembly using appropriate tools, instruments and techniques according to safe working practices • Conduct visual and functional checks of assembled products for compliance with required specifications • Perform maintenance, lubrication and/or modification fittings on assembled products • Test assembled devices for functionality • Clean and inspect tools and instruments for wear and/or damage after use • Perform housekeeping to maintain work areas in a safe and healthy condition • Carry out waste disposal in accordance with safe working practices and approved procedures 	<p>practices and organisational procedures</p> <ul style="list-style-type: none"> • Check surface smoothness of linear motion guides, in accordance with specification requirements • Lubricate linear motion guides • Assemble different types of bearings within machine tools • Assemble ball screw assemblies and perform vertical and horizontal ball screw alignment • Perform pre-tensioning using spacers, in accordance with specification requirements • Take corrective actions against identified errors 	<p>accordance with design specifications</p> <ul style="list-style-type: none"> • Plan the machine sequences in accordance with workflow plans • Determine the limits and fits critical for the assembly with respect to the design drawings • Complete quality check on the sub-assemblies or assemblies for accuracy and functionality with reference to the design drawings • Set datum and references using appropriate gauges and alignment devices • Use appropriate measuring devices to check for compliance with the design drawings and specifications • Take corrective actions against non-conformity based on design drawings and specifications • Test and adjust machine elements to achieve required machine specifications • Produce and conduct quality checks on work piece samples for dimensional accuracy and visual defects • Perform reliability tests on assembled machines, in accordance with the machine specification checklists 			
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