

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

TSC Category	Manufacturing and Operations					
TSC	Cleanliness and Contamination Control					
TSC Description	Establish and implement contamination and cleanliness controls in the manufacturing work environment					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	PRE-CLO-1008-1.1	PRE-CLO-2008-1.1	PRE-CLO-3008-1.1	PRE-CLO-4008-1.1	PRE-CLO-5008-1.1	
	Perform good cleanroom practices when carrying out work tasks in cleanrooms	Facilitate continual cleanroom practices in manufacturing tasks	Manage workplace cleanliness and contaminants by defining and assessing proposed solutions to meet cleanliness requirements	Develop cleaning plans by differentiating requirements when using manual and automatic cleaning technology, and conducting contamination risk management activities	Evaluate cleaning process plans to determine appropriate cleaning processes for manufacturing	
Knowledge	<ul style="list-style-type: none"> Types of cleanroom and zoning classifications Types of cleanroom clothing, machinery, equipment and materials Cleanroom gowning procedures Principles of cleanroom testing Types of contamination and cleanroom contamination control procedures Types of aseptic monitoring in cleanrooms Requirements for personnel hygiene 	<ul style="list-style-type: none"> Types of cleanroom and zoning classifications Types of cleanroom clothing, machinery, equipment and materials Cleanroom gowning procedures Types, sources and impact of contaminants on tasks and products worked on Requirements for proper contaminant risk management systems Requirements for proper cleaning and sanitation programmes Concepts of management control programmes and systems for cleanliness and contamination control Types of contamination and cleanroom contamination control procedures Types of aseptic monitoring in cleanrooms Requirements for personnel hygiene 	<ul style="list-style-type: none"> Types, sources and impact of contaminants on tasks and products worked on Types of cleaning processes Types of cleaning technologies and process methods Factors affecting cleaning process efficiency Types of cleanliness validation methods Concept and principles of technical specifications for cleanliness requirements 	<ul style="list-style-type: none"> Type of contaminations applicable to manufacturing and/or cleanrooms Principles of contamination transfer and risk management Sampling methods to monitor hazards and control of contaminants Testing methods for cleanliness Alert activation levels related to contaminants Cleaning equipment and procedures for use Types of quality requirements for parts cleaning Methods, tools, systems and implements of contamination cleaning plans Contamination management legislation, regulations, practices and guides Staff training related to risk management 	<ul style="list-style-type: none"> Principles of precision engineering Methods for evaluating engineering processes Tools for evaluating engineering processes Criteria for evaluating engineering processes Types and impact of recommendations on engineering processes Workplace safety and health (WSH) requirements 	

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<p>Abilities</p>	<ul style="list-style-type: none"> Identify types of clothing, machinery, equipment and materials associated with cleanroom environments Perform gowning procedures Perform cleanroom contamination control procedures Perform aseptic monitoring in cleanroom Perform checks for personnel hygiene 	<ul style="list-style-type: none"> Develop personal hygiene training programmes for workers Develop strategies to prevent potential sources of contamination that could arise from manufacturing processes and staff behaviour Verify proper performance of gowning, contamination control procedures and personnel hygiene by staff Verify aseptic monitoring in cleanroom by staff 	<ul style="list-style-type: none"> Identify different types of contaminants in the workplace and operational environment Identify suitable cleaning technologies and processes Contribute ideas to evaluate potential risks of contamination at the workplace Communicate cleanliness requirement specifications with vendors and specialists Identify relevant methods for cleanliness testing Review the adequacy of cleaning processes in proposed solutions by suppliers 	<ul style="list-style-type: none"> Analyse manufacturing processes to determine sources of contamination and cleaning requirements Analyse sources of contamination in manufacturing processes to determine risks due to air transfer, worker behaviour, material, equipment and machinery handling Determine appropriate cleaning processes to suit application requirements, contamination and hazards risk control measures and contamination cleaning plans Develop cleaning process plans for specific applications Supervise cleaning processes to ensure required solutions are achieved Evaluate cleaning recipes and contamination cleaning plans, and advise on defects Design quality control procedures to address aspects of product cleanliness and compliance to regulatory requirements Review, update and document contamination risk management systems, in accordance with standards and requirements Develop measures for enhancing contamination 	<ul style="list-style-type: none"> Apply analysis methods to determine cleaning requirements, in accordance with work specifications Review cleaning processes for suitability to application requirements Evaluate selected cleaning applications for suitability to work specifications Evaluate cleaning process plans for effectiveness to particular applications Evaluate quality control procedures for effectiveness in addressing product quality and compliance to regulatory requirements 	
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