

**SKILLS FRAMEWORK FOR FOOD MANUFACTURING
TECHNICAL SKILLS & COMPETENCIES (TSC) REFERENCE DOCUMENT**

TSC Category	Research and Development					
TSC	Active and Smart Packaging					
TSC Description	Application of active/smart packaging methodology and processes to improve shelf-life, quality and safety of food product					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
		FMF-RND-2007-1.1	FMF-RND-3007-1.1	FMF-RND-4007-1.1	FMF-RND-5007-1.1	FMF-RND-6007-1.1
		Operate active/smart packaging equipment	Deploy active/smart packaging processes and equipment in production workflows	Evaluate effectiveness and sustainability of implemented active/smart packaging processes for process improvements	Formulate new active/smart packaging workflows to streamline manufacturing processes in line with organisational strategies	Explore wider applications of active/smart packaging methods in the organisation
Knowledge		<ul style="list-style-type: none"> Packaging procedures for different food products Active food packaging materials Food package labelling Features and indicators of package integrity Environmental conditions to which active packaging will be exposed to and should withstand 	<ul style="list-style-type: none"> Packaging requirements for different food products Active food packaging materials and active ingredients Active food packaging functions and designs Active food packaging techniques Principles of biopolymers biodegradation process under the enzymatic action of microorganisms Use of additives in biodegradable films and coatings for active food packaging Food package labelling Features and indicators of package integrity Environmental conditions to which active packaging will be exposed to and should withstand 	<ul style="list-style-type: none"> Client requirements Biodegradable packing High cost involved in biodegradable packing Consumer acceptability of the active packaging process Effect of microbiology on shelf life Environment impact of different packaging types and materials Domestic and international food contact regulations Good manufacturing practices (GMPs) 	<ul style="list-style-type: none"> Food packaging and its environmental impact Applications of biopolymers in the food industry Biodegradable active packing High cost involved in biodegradable packing Consumer acceptability of the active packaging process Future directives of food contact regulations 	<ul style="list-style-type: none"> Implications of packaging on marketing functions and consumer acceptability Packaging for novel processes
Abilities		<ul style="list-style-type: none"> Apply suitable active/smart packaging techniques, based on product specifications Carry out troubleshooting on 	<ul style="list-style-type: none"> Determine active packaging techniques to be applied based on product specifications and functions 	<ul style="list-style-type: none"> Develop active food packaging plans to meet clients' requirements Analyse and determine the variety of active packaging materials and 	<ul style="list-style-type: none"> Integrated technologies to facilitate automated active packaging processes Initiate active packaging systems for suitable food 	<ul style="list-style-type: none"> Assess the impact and risks of active packaging to manufacturing operations and supply chain operations

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		<p>active/smart packaging equipment and machinery</p> <ul style="list-style-type: none"> Report anomalies in production and escalate issues for further actions 	<ul style="list-style-type: none"> Determine packaging materials to be used, based on selected active packing techniques Deploy suitable active packaging processes based on food product requirements Develop active packaging polymers from renewable and sustainable resources Estimate lead-times, costs and schedules Organise active packaging process sequencing to maximise efficiency 	<p>products commonly used in the food industry</p> <ul style="list-style-type: none"> Review packaging processes for performance in line with GMP procedures and standard protocols Adapt appropriate food laws, particularly in relation to labelling requirements and material property restrictions in order to develop legislative constraints on packaging solutions Apply optimisation techniques to improve active packaging process efficiency and product quality Assess the impact of manufacturing process improvements Review development of biodegradable polymers made from renewable and sustainable resources 	<p>product lines to extend shelf life with integration of processing, transport, traceability and information system requirements of labelling or legislation</p> <ul style="list-style-type: none"> Evaluate impact on consumer interaction with products, sustainability and cost. Ensure procedures and operations are implemented according to plan and workplace safety and health (WSH) requirements 	<ul style="list-style-type: none"> Assess the impact and risks of external conditions to implementation of active packaging Influence organisational active packaging application strategy in alignment with process improvement assessment results Prepare business cases for implementing active packaging that satisfy business and legislative requirements Evaluate the active packaging integration plans to satisfy manufacturing requirements
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