

FCP Refrigeration Module: Topics, Learning Outcomes, Benefits and Delivery Methods

Section 1 – Scope and Application

Scope	Learning outcome	Benefits	Slides	Delivery method
Key professional food service refrigeration products, their applications and selection criteria.	Understand the various key professional food service refrigeration products, including their specifications, intended applications, and selection criteria, such as appropriate sizing, chilled versus frozen requirements, features, and climate class.	Participants will be equipped with the foundations to make sustainable and energy-efficient choices, alongside the broad pressures applying to the selection and application of refrigeration, as well as gain context for the rest of the course.	4-19	Section 1. Recorded slides to watch at delegates own pace

Section 2 – How it Works

Scope	Learning outcome	Benefits	Slides	Delivery method
Key principles of refrigeration	Understand the essential principles of cooling	Participants will understand how commercial refrigeration works in order to design, apply, use and maintain equipment effectively, thereby keeping its energy consumption and emissions to a minimum.	4-20	Section 2. Recorded slides to watch at delegates own pace
Key components in refrigeration systems	Identify and describe the functions of the major components in a refrigeration system.	Participants will be able to discuss the importance of each component in maintaining the efficiency and performance of the system, while reducing carbon emissions.		

Section 3 – Refrigerants

Scope	Learning outcome	Benefits	Slides	Delivery method
Key properties of refrigerants	Understand key properties of refrigerants, including their ozone depletion and global warming potential	Develop an environmental stewardship mindset by understanding the impact of refrigerants on the environment, contributing to sustainable practices in the industry.	4-7, 23	Section 3. Recorded slides to watch at delegates own pace
Context of environmental legislation concerning refrigerants	Develop a solid background on why legislation mandates the continued investment in developing and implementing 5 th generation refrigerants	Stay ahead in the industry by understanding regulatory trends and technological advancements, ensuring compliance and leveraging new opportunities for innovation.	8-9, 21	
Types of refrigerants	Distinguish between different types of refrigerants	Gain the ability to make informed decisions when selecting refrigerants for various applications, enhancing system performance and compliance with regulations.	10-18	
Calculating the carbon impact of refrigerants	Learn to calculate carbon dioxide equivalent emissions from typical refrigerant charges	Acquire practical skills to assess and quantify the environmental impact of refrigerant choices, enabling more accurate reporting and better environmental management.	19-20	
The importance of energy efficiency	Appreciate the impact of refrigerant selection on the energy efficiency and consumption of refrigeration systems	Improve operational efficiency and reduce energy costs by selecting refrigerants that optimise the performance and energy consumption of refrigeration systems.	22-23	

Section 4: Legislation and Regulation

Scope	Learning outcome	Benefits	Slides	Delivery method
Ecodesign for refrigeration	Understand how the Ecodesign directive applies to different refrigeration product groups.	Gain the ability to ensure compliance with energy efficiency standards, leading to reduced operational costs and enhanced environmental responsibility.	4-9	Section 4. Recorded slides to watch at delegates own pace
Energy labelling requirements	Be able to understand product group energy labels, and the explain the differences between them, and the EU and UK energy labels that have arisen in the wake of Brexit.	Develop the expertise to accurately interpret and utilise energy labels, enabling informed decision-making and improved sustainability performance.	10-22	
F-gas regulations compliance	Understand the F-gas regulations, phase out dates and the practical actions that need to be taken to comply.	Acquire knowledge of critical compliance measures to avoid legal penalties and contribute to the reduction of greenhouse gas emissions.	23-29	
Other environmental legislation affecting refrigeration	Understand other broad environmental regulation such as WEEE, UKREACH and other sustainability reporting,	Enhance your ability to navigate complex regulatory landscapes, ensuring comprehensive compliance and supporting your company's commitment to sustainability and corporate social responsibility. Provide authoritative advice to clients, partners and colleagues about the broad regulatory landscape of energy and carbon related regulations for refrigeration.	30-32	

Section 5: Lifetime Emissions

Scope	Learning outcome	Benefits	Slides	Delivery method
<p style="text-align: center;">Lifetime emissions of foodservice refrigeration</p>	<p>Gain comprehensive knowledge of the total carbon emissions associated with foodservice refrigeration equipment throughout its entire lifecycle, from production to disposal.</p> <p>Appreciate the emissions from foodservice refrigeration in the context of the UK's total carbon emissions.</p>	<p>Equip yourself with the knowledge to identify and select refrigeration systems with lower lifetime carbon, enabling you to make environmentally responsible design and/or purchasing decisions that enhance your organisation's sustainability credentials and potentially reduce long-term costs.</p>	<p style="text-align: center;">4-9</p>	<p style="text-align: center;">Section 5a. Recorded slides to watch at delegates own pace</p>
<p style="text-align: center;">Embodied carbon of refrigerators</p>	<p>Develop an understanding of reducing the carbon footprint embedded in the materials and manufacturing processes of refrigeration units.</p>	<p>With appreciation of the carbon emissions within the supply chain, from raw material extraction, processing, assembly and packaging, you can better implement energy efficiency, renewables and heat recovery in manufacturing to reduce the embodied emissions in your products.</p>	<p style="text-align: center;">10-13</p>	
<p style="text-align: center;">Design for low carbon</p>	<p>Learn how to evaluate and implement design strategies that minimise the carbon footprint of refrigeration systems, emphasising sustainable and efficient technologies.</p>	<p>Grasping the principles and available options relating to selection, design and installation of a refrigerator and linking them to reducing carbon emissions can develop solutions that assist the end user in minimising energy use, costs and emissions.</p>	<p style="text-align: center;">14, 19-20</p>	
<p style="text-align: center;">Transport and distribution</p>	<p>Understand the environmental impact of transportation and distribution processes for refrigeration equipment and</p>	<p>Acquire the knowledge to optimise transportation and distribution processes for refrigeration equipment, enabling your organisation to lower its logistics</p>	<p style="text-align: center;">15-18</p>	

	identify methods to reduce associated carbon emissions.	related carbon footprint, improve operational efficiency, and enhance its reputation for sustainability.		
Reduction of energy and carbon in the use of refrigeration systems	Understand the importance of training operators in best practice such as the importance of the correct use and loading of the cabinet and effects of external influences on energy and carbon emissions in the use phase.	Take practical actions to ensure the refrigerator is used appropriately for energy and emissions reduction, and guard against incorrect use affecting the associated carbon emissions of a product.	21-29	
Food safety and waste reduction	Explore the relationship between effective refrigeration management and food safety, with a focus on reducing food waste and associated carbon emissions.	Understand how maintaining the correct storage temperatures, utilising appropriate HACCP functions and improved connectivity can reduce food waste in a refrigerator and the associated carbon from waste to ensure performance & efficiency work together to improve sustainability in foodservice operations.	30	
The importance of staff training	Recognise the importance of staff training in best practice for the efficient use and maintenance of refrigeration systems, to ensure optimal performance and energy savings.	Understand the influence of operator and technician behaviours and utilise training in the reduction of energy and carbon from refrigeration.	31	
Appropriate maintenance of refrigeration systems	Understand the carbon footprint associated with maintenance activities and how these reduce the in-use and end of life emissions, and raise the asset value of refrigeration products.	Appreciation of the carbon footprint of maintenance activities such as travel to site, reactive versus planned activities and the embodied footprint of sundry items will help you to balance these factors to optimise logistics planning and reduce overall	4-8	Section 5b. Recorded slides to watch at delegates own pace

		emissions throughout the product's lifetime.		
Fugitive emissions from refrigeration	Examine the causes and impacts of fugitive emissions from refrigerant leakage and develop strategies to minimise these emissions effectively	By gaining insights into the prevention and management of refrigerant leakage, delegates can significantly reduce operational costs and enhance the environmental sustainability of their operations, leading to better compliance with regulations and improved company reputation.	9-11	
Innovation and development in refrigeration technology	Explore the latest innovations and developments in refrigeration technology, and understand how these advancements can be integrated into current systems to improve efficiency and sustainability.	Delegates will stay ahead of industry trends, enabling them to implement cutting-edge technologies that enhance energy efficiency, reduce operational costs, and position their business as a leader in sustainable practices.	12-19	
End of (first) life of refrigeration systems	Understand end-of-life treatment and the waste hierarchy of refrigeration systems, focusing on responsible disposal, recycling, and recovery of materials to minimise environmental impact.	Delegates will gain the knowledge to implement effective end-of-life management strategies, ensuring compliance with environmental regulations, reducing waste, and maximising the recovery of valuable materials, ultimately enhancing their company's sustainability profile, and reducing long-term disposal costs.	20-21, 24-27	
Lifecycle costs	Analyse the principles of lifecycle costing for refrigeration systems, including the assessment of initial purchase costs, operating expenses, maintenance costs, and end-	Delegates will be equipped with the skills to make informed purchasing decisions and/or recommendations by evaluating the true cost of refrigeration systems over their entire lifespan, leading to more cost-effective investments, improved	22-23	

	of-life disposal costs to determine the total cost of ownership.	budgeting, and enhanced financial planning, while also identifying opportunities for cost savings and efficiency improvements.		
Case studies of whole lifetime emissions	Examine case studies that illustrate the whole lifecycle carbon emissions of refrigeration systems, from raw material extraction through to end-of-life disposal.	Delegates will gain practical insights into how theoretical concepts apply in real-world applications and impacts, enabling them to better evaluate and implement effective strategies for reducing carbon emissions in their own projects and operations. This knowledge can lead to the provision of more authoritative advice to channel partners.	28-31	