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| 1. Title      | Apply knowledge of environmental impact of refrigerants and foamers  |
| 2. Code       | EMACSH302A   |
| 3. Range      | Apply knowledge of the environmental impact of refrigerants and foamers, at design studios, air-conditioning and refrigeration system work sites or machine rooms, in tasks of installation, operation, repair, maintenance, safety, health and environmental protection for air-conditioning and refrigeration services.  |
| 4. Level      | 3  |
| 5. Credit     | 6  |
| 6. Competency | <p style="text-align: center;"><u>Performance Requirements</u></p> <p>6.1 Apply knowledge of environmental impact of refrigerants and foamers</p> <ul style="list-style-type: none"> <li>◆ Understand the impact of refrigerants and foamers, including: <ul style="list-style-type: none"> <li>• Composition and properties of chlorofluorocarbon (CFC) and hydro chlorofluorocarbon (HCFC) as refrigerants</li> <li>• Functions of ozone layer and causes of its depletion</li> <li>• International actions for the ozone layer protection and the progress made</li> </ul> </li> <li>◆ Understand the impact of refrigerants on greenhouse effect, including: <ul style="list-style-type: none"> <li>• Implications of greenhouse gases and greenhouse effect</li> <li>• 3 ways to evaluate the impact of gases on greenhouse effect: global warming potential (GWP), total equivalent warming impact (TEWI) and life cycle climate performance (LCCP)</li> <li>• GWP of commonly used refrigerants</li> <li>• International actions taken to control the emission of greenhouse gases and the progress made</li> </ul> </li> <li>◆ Understand the properties of substitute refrigerants, including: <ul style="list-style-type: none"> <li>• Major considerations for choosing substitutes for CFCHCFC refrigerants</li> <li>• Properties of various types of substitute refrigerants</li> <li>• International evaluation of substitute refrigerants</li> </ul> </li> <li>◆ Understand the recovery and disposal of refrigerants, including: <ul style="list-style-type: none"> <li>• Working principles and applications of various types of refrigerant recovering machinery</li> <li>• Impurities need to be separated from the recovered refrigerants</li> <li>• Ways to dispose exhausted refrigerants</li> </ul> </li> </ul> |

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|                        | <ul style="list-style-type: none"> <li>◆ Understand the applications of substitute foamers in foam-thermal insulation, including: <ul style="list-style-type: none"> <li>• Foaming methods for various types of CFC substitutes</li> <li>• Properties of various types of substitute foamers</li> <li>• Comparison of the properties of various types of substitute foamers</li> <li>• Comparison of the substitutability of various types of substitute foamers for foam-thermal insulation</li> </ul> </li> </ul> <p>6.2 Application of knowledge of environmental impact of refrigerants and foamers</p> <ul style="list-style-type: none"> <li>◆ Apply knowledge of the environmental impact of refrigerants and foamers in the design, installation, operation, repair and maintenance of air-conditioning and refrigeration equipment to minimize the damage of refrigerants and foamers to the environment</li> </ul> |
| 7. Assessment Criteria | <p>The integrated outcome requirement of this unit of competency is:</p> <p>(i) Capable to apply knowledge of the environmental impact of refrigerants and foamers in the design, installation, operation, repair and maintenance of air-conditioning and refrigeration equipment to minimize the damage of refrigerants and foamers to the environment.</p>   |
| 8. Remarks             | <p>The credit value of this unit of competency is set on the presumption that the person already possesses basic knowledge of refrigerants.</p>  |