Synthetic Refrigerant Stewardship Milestone 4: Report 2

Training Overview Document

This scoping report has been prepared by the Synthetic Refrigerant Stewardship Working Group as part of a process to develop an industry led product stewardship programme for synthetic greenhouse gas refrigerants in New Zealand.

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Questions regarding this report should be directed to the Synthetic Refrigerant Stewardship Project Manager whose contact details appear below.

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Product Stewardship Scheme for

Training and Licensing Requirements

Introduction

Members of the broader Heating, Ventilation, Air Conditioning and Refrigeration (HVAC&R) Industry, including subject matter experts (SME's) from these and the Industry Training entity Refrigerant License New Zealand (RLNZ), have discussed at length the training and accreditation requirements for a successful Product Stewardship Organisation handling Synthetic Refrigerants (SR). In formulating this document IRHACE has also consulted with SME's of the Automotive Industry Associations who have provided input.

The below document covers two specific areas, which must be considered in tandem,

- 1. Industry Training
- 2. Accreditation/ Licensing

The Working Group of SME's involved in developing this document is confident that including this training and licensing/accreditation regime will ensure industry needs are addressed under a Product Stewardship Scheme for Synthetic Refrigerants (SR).

Supporting Documentation

Attached are 3 Appendices which illustrate the content of the Training Programme from a Qualifications perspective. These are:

- Training Matrix (Appendix A)
- Summary of Qualifications by Sector (Appendix B)
- Refrigerant Unit Standards Explained (Appendix C)

Training & Licensing

To successfully operate a training and licensing/accreditation regime the Product Stewardship Organisation will require important data and insights on the industry. The Working Group recommends that the PSO should partner with recognised industry training organisations. This will allow continuity for existing training, along with quality and speed to market.

The Working Group points out, Approved Filler Compliance Certificates are key to the training requirements under the Health & Safety at Work Act. Organisations who have authority to deliver Compliance Certificates, have more contact with more technicians in the HVAC&R industry than anyone other than the technicians' employers.

This positions these organisations well to assess and maintain the knowledge levels and competency of the technicians as part of this accreditation/licence, and to continue to develop the industry specific training which RLNZ has done for both apprentices and technicians for over 10 years.

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Industry Training

The HVAC&R Industry SME's in developing this framework, are aware of the HFC Phasedown of Synthetic Refrigerants (SR) and resultant introduction of new often flammable, or toxic refrigerants coming to market. The Working Group of SME's has proactively met over several years, to develop a robust training and accreditation regime to support all refrigerants.

Cognisant of the often conflicting, Health & Safety and environmental needs our industry is faced with, training has been developed to reflect these situations and all refrigerants, not only SR's. We have covered training for SR's. There is, however, no doubt technicians will require training in all refrigerants. With many of our SME's closely involved in training over many years, a number of these SME's have supported apprentices into the industry. They have in developing this document drawn on experience and their collective insights to develop a comprehensive training programme appropriate to the tasks they undertake.

Recommended training verticals

Specific to this, is recognition that this training cannot be 'One size fits all'. As illustrated in the table on Appendix A, current training modules and desired training to meet those health & safety and environmental demands have been addressed.

One benefit for the below model allows technicians to gain a qualification which can become a 'building block' towards another vertical in the future, should the employment focus change. This model is consistent with governments' expectation of tertiary and skills based learning in a changing marketplace.

There are 6 specific Levels of license for those working on Synthetics, which will be administered by the PSO:

- Automotive, National Certificate in Motor Industry 3 Classes of License
- Appliance Servicing Class 1 License
- RAC Trade Assistant L3 Class 1 License
- Building Services Installer L4 Class 3 License
- Air Conditioning Installer L4 Class 3 License
- Commercial / Industrial Refrigeration and Air Conditioning (RAC) Class 4 License

Training common across all sectors

Some businesses do specialise in a specific activity within the industry i.e. domestic heat pumps installation and servicing or commercial refrigeration. Simply though, all must have a similar grounding in key tasks, NZ is too small to risk inadequately trained technicians who have potential to find workarounds. This common training would include (but is not limited to)

- Approved Filler US28950
- Jointing, US 2679, US 23959
- Leak testing, US 28953
- Health and Safety (various Unit Standards)

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Permitted Activity under NZQA

We have also detailed in the Training Table Matrix (Appendix A) the on and off job requirements (Permitted Activity) under the NZQA qualification framework. This is further expanded in Summary of Qualifications by Sector (Appendix B) which covers the purpose and outcome of such training, in more detail as an overview of the individual courses.

Unit Standards

The Training Table Matrix (Appendix A) lists the current Unit Standards which are for the most part, 'fit for purpose', and also identifies a number of Unit Standards which will require review to ensure improved handling of synthetics under the Product Stewardship Scheme, which include:

- Leak Testing US28953
- Jointing and brazing of pipe, US 2679, US23959

Automotive Training Requirements

Separate to this, holding a unique position in the market, the automotive industry has also provided input.

The automotive industry requires a qualification framework that addresses all the activities related to diagnostic, servicing and repair of automotive air conditioning systems as well as specifically, the collision repair and vehicle dismantling sector(excluding mobile refrigeration systems). A list of unit standards that make up this minimum standard to be a licensed worker in this industry are attached in Appendix B which includes proposed additional unit standards.

To ensure consistency of standards within the automotive air-conditioning industry we recommend that an industry code of practice be mandatory as part of this regime. The current MTA automotive air-conditioning code of practice introduced in 2013 will be refreshed to reflect current working requirements and will form the basis of industry wide consultation on an accepted code of practice.

The licensing regime for automotive air-conditioning activities will cover current refrigerants used in automotive application and allow for new automotive refrigerants as they come into play (currently refrigerants such as R134A, 1234YF).

Some points specific to the automotive industry are:

- In considering training across all sectors, the Approved Filler unit standard and training courses are being updated to accommodate focussed outcomes for the automotive sector where appropriate.
- With regard to additional Unit Standards, Jointing and brazing within automotive installations is not common and typically, joints that technicians work with have mechanical fixings. There are, however, pre-trade qualification unit standards that adequately cover learning outcomes required for the limited situations where jointing and brazing would be required.

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• In the licensing/ accreditation of International Qualifications for automotive, there will be cross referencing of vehicle manufacturers specific product training as evidence of meeting the same requirements of equivalent unit standards listed in the proposed automotive training framework

Licensing regime

The automotive industry SME's will need to be closely involved (preferably running) the licensing regime for automotive air-conditioning technicians. Due to the motor industry associations prime contact with automotive technicians along with continued experience in the knowledge level and competency of these technicians. The automotive industry are best placed to assess and recommend equivalence of competency and qualification.

The automotive "and" HVAC&R industries would implement a 5-year licensing period with a subsequent 5-year renewal.

Accreditation/Licensing

Assessing training and qualifications for a license/accreditation under the Product Stewardship Organisation will not be a 'one size fits all'. There are a number of variables and hurdles, to encounter in order to license/accredit a technician.

Some of those variables include:

Technician holding a NZQA recognised Trade Certificate

If the technician holds a current L4 Refrigeration and Air Conditioning Trade Certificate, and had completed all other relevant qualifications, such as Approved Filler Certification, and the technician can verify they have been and are currently working in the industry, they should then qualify for accreditation/licensing.

Grandparenting of all existing technicians

Grandparenting of the workforce will support a smooth and fair transition into a license/accreditation regime under the Product Stewardship Scheme.

All technicians will be admitted into the license/accreditation Scheme under the Product Stewardship Scheme with a prior acceptance lead in period of 2 years.

The Working Group recommends both an online/face to face and a practical course for final granting of license/accreditation to ensure competency on final granting of license within that two year period.

Recognition of prior learning to attain License/accreditation

Recognition of Prior Learning will be needed for those technicians who are currently working within the industry, but for whatever reason are unable to produce the required documentation to be automatically licensed/accredited.

NZQA provides a programme to accommodate these technicians, *Recognising learning for credit: Guidelines for the recognition and award of credit for learning*. All applicants will need to have completed other

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relevant industry related training prior to their application, such as Approved Filler Certificate. The Working Group also recommends completion of a practical course before the license is granted.

License/accreditation for applicants with international qualifications

The working group has identified International Qualifications relevant to the Refrigeration and Air Conditioning Industries that could be acceptable for licensing/accreditation purposes. These include F-Gas, City & Guilds, and Artic.

Technicians applying for licence/accreditation via this method will still need to complete other required training for NZ situations, including Approved Filler Certification.

The Working Group recommends completion of both an online/face to face and a practical course to ensure competency prior to finally granting of license/accreditation.

Capstone assessments for overseas applications

Capstone practical assessment is an alternative method to assess applications where evidence of qualification is not evident.

The Working Group will requires the applicant provide prior evidence of additional training to meet the minimum standards identified online/face to face and a practical assessment will be required to finally attain a license/accreditation.

Licensing Board/Organisation

To operate a successful licensing regime the responsibilities of the licensing board under the Product Stewardship Organisation are to include:

- Manage the accreditation activities of the PSO for Synthetic Refrigerants
- License technicians based on proof of competency and wider assessment criteria (as above for Accreditation and Licensing)
- Maintaining a register of Licensed Technicians
- Investigate and adjudicate on complaints
- Review and manage renewals

It is also recommended, based on other similar models, that this board is administered separately to the Product Stewardship Organisation, on that basis the HVAC&R industry SME's will need to be closely involved (preferably running) the licensing regime for HVAC&R technicians. It would be possible to share governance however, the two functions, (Licensing/ Accreditation and activities of the Product Stewardship Scheme) are very different and require different skillsets to administer.

License Renewals

A programme will be developed to handle license/accreditation renewals closer to the end of the first license/accreditation term. To be consistent with the HSWA requirements, the Working Group has agreed on a 5 year renewal. Key points of this programme are:

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- Need to evidence upskilling over the term of the license/accreditation period
- Renewal criteria
- Incorporate CPD (Continuing Professional Development)
- A comprehensive database to ensure a high standard of record keeping
- Time required for renewal application to be approved
- Cost to approve renewal application

In Conclusion

This training overview developed by IRHACE for the successful, Product Stewardship Organisation will provide a more robust level of training and accreditation than that currently seen in our unregulated industry.

This, however, sits with one sizeable caveat.

The Working Group would not be doing its job If it was not to express deep concerns about the proposed regime under the Product Stewardship Scheme. In particular, that without prompt intervention there will be two license regimes, added cost, resource and potential for disengagement of industry, including loopholes and room for error. The HVAC&R and automotive industries are committed to seeing a formal license regime for <u>all</u> refrigerants and technicians and whilst they welcome the implementation of a Product Stewardship Scheme and see this formalised training and license/accreditation regime as a significant step along that path, they cannot ignore the other 'elephant in the room' and significant potential for unwarranted duplication and significant expense for industry.

HVAC&R is a small and understaffed industry. Ignoring industry need and not working to provide a unified scheme will be futile and would be likely to disengage participation in either scheme, directly compromising safety and compliance.

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Possible structine to accommodate & administer 2 licensing organisations



The Working Group, encompassing the wider HVAC&R Industry and the automotive industry, is committed to seeing a comprehensive and fair Licensing Regime, incorporating both; a safe workplace for all, along with ensuring NZ meet its obligations under the Montreal Protocol as the HFC Phasedown progresses.

Based on the examples made above, the working group has asked to reinforce, out the need for a single license regime to encompass both the Product Stewardship Scheme and the Worksafe Refrigerant License Regime which would cover use of <u>all</u> refrigerants.

We ask for immediate and committed dialogue on this matter, in particular to establish common ground with potential for an Umbrella License structure for the industry or a solution which would facilitate a single license.

For questions or further information on this document, in the first instance, please contact

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Product Stewardship Scheme Training Training Matrix (Appendix A)

	Industry	Automotive	Appliance	Trade Assistant	Building services	Airconditioning	Commercial / Industrial
	Sector	CLASS 1 2 3 Licence	Servicing	CLASS 1 License	Installer L4	Installer L4	Refrigeration and Air
		CLASS 1, 2, 3 Litence	CLASS 1 Licence		CLASS 3 License	CLASS 3 License	CLASS 4 License
	Title	National Certificate in Motor Industry (3 qualifications below)	New Zealand Certificate in Electrical Engineering	New Zealand Certificate in Refrigeration & Air Conditioning (Trade Assistant)	New Zealand Certificate in Mechanical Building Services (Trade)	New Zealand Certificate in Air Conditioning Installation (Proposed course with NZQA for approval)	New Zealand Certificate in Refrigeration and Air- Conditioning (Trade)
	Qualification	<u>Class 1</u> Automotive License	L3 Pre trade	L3 Pre trade	4 YEAR APPRENTICESHIP	2 YEAR Apprenticeship NO electrical	Level 4 Refrigeration and air- conditioning (RAC)
6		<u>Class 3</u> Automotive	Appliance servicing		In development	Installation focused apprenticeships i.e. more on	+ including Approved Filler +Flammable Awareness
Ηр		Dismantler & Collision Repair License	+ Approved Filler			Job	Service focused Technical
rants ar		<u>Class 2</u> Automotive				+ Approved Filler	
ithetic Refrige	Current Unit Standards	981, 3397, 19666, 24443, 24444, 24445, 24446, 24447, 24448, 24449 24451, 24452, 28950, 28952, 29563, 29577, 30565, 31124, 31127	19666, 28952, 28950, 29563	19666, 29563	19666, 26336, 28952, 29563, 28950, 23959, 29563, 22707, 31142	31142,22441, 23959, 22707, 28950, 28959, 19666,28952, 29563	19666, 28952, 28970, 28959 28960, 28965, 28963, 23959 28950, 28953, 3846, 3851 3874, 28956, 29563
Syr	Unit Standards for review		Leak testing - 28953 Jointing – 2679, 23959	Leak testing - 28953 Jointing – 2679, 23959	Leak testing - 28953 Jointing – 2679, 23959	Leak testing - 28953 Jointing – 2679, 23959	Leak testing - 28953 Jointing – 2679, 23959
	Permitted activity	Able to install service and repair or dismantle Automotive Airconditioning Systems. Able to purchase	Able to service appliances containing refrigerant. Only includes system not permanently connected to the build power	To handle a refrigerant while undertaking training and/or assessment in a classroom setting and at your work-place under	To handle a refrigerant while undertaking training and/or assessment in a classroom setting and at your workplace under supervision. The supervisor must be the holder	Able to purchase, install and de-commission air- conditioning PLANT AND EQUIPMENT UP TO 50kW Able to purchase NON	Able to purchase, service, install and de-commission air- conditioning and refrigeration equipment. Able to purchase ALL
eneral		refrigerant Able to recover refrigerant	supply Able to purchase refrigerant	supervision. The supervisor must be the holder of a licence that entitles them to engage in work for which the	of a licence that entitles them to engage in work for which the licensee is being trained.	HAZARDOUS refrigerant Able to recover refrigerant	refrigerants Able to recover refrigerant
Ğ			Able to recover refrigerant	licensee is being trained.			
	License renewal	5 Years	5 Years	5 Years	5 years	5 years	5 Years
	Notes	Unit standards listed, releva	ant to technicians working wi	th refrigerant only			
		Current Unit Standards to be	e added are Unit Standards t	hat cover flammable and ref	rigerant management		

Product Stewardship Scheme Training

Summary of Qualifications by Sector (Appendix B) Automotive Sector

Industry Sector	Automotive				
Qualification name	National Certificate in Motor Industry				
Level	Level 3				
Course Term	18 – 24 Months				
Class	Class 1 Automotive License				
Domain	Automotive Heating, Ventilation, and Air Conditioning				
Existing Unit	981. 3397, 19666, 24445, 24446, 24447, 24448, 24449, 24451, 28950,				
Standards included in	28952, 29563, 29577, 30565, 31127				
Course					
Unit Standards to be	3397 - Retro fit Auto Air Conditioning System				
developed to meet					
future objectives					
Permitted Activity	 Able to install service and repair Automotive Air Conditioning 				
	Systems under supervision.				
	Able to recover refrigerant				
Renewal Term	5 Years				
Notes	Include Automotive Specific Unit Standards, relating to refrigerants				

Summary of Qualifications by Sector (Appendix B) Automotive Sector

Industry Sector	Automotive				
Qualification name	National Certificate in Motor Industry				
Level	Level 3				
Course Term	6 – 12 Months				
Class	Class 3 Automotive Dismantler & Collision Repair License				
Domain	Automotive Heating, Ventilation, and Air Conditioning				
Existing Unit	19666, 29577, 28950, 28952				
Standards included in					
Course					
Unit Standards to be					
developed to meet					
future objectives					
Permitted Activity	 Able to remove & refit Automotive Air Conditioning system 				
	components.				
	Able to recover refrigerant				
Renewal Term	5 Years				
Notes	Include Automotive Specific Unit Standards, relating to refrigerants				

Summary of Qualifications by Sector (Appendix B) Automotive Sector

Industry Sector	Automotive
Qualification name	National Certificate in Motor Industry
Level	Level 4
Course Term	12 Months
Class	Class 2 Automotive License
Domain	Automotive Heating, Ventilation, and Air Conditioning
Existing Unit	24443, 24444, 24446, 24452, 31124
Standards included in	
Course	
Unit Standards to be	
developed to meet	
future objectives	
Permitted Activity	Able to install service and repair Automotive Air Conditioning
	Systems
	 Able to purchase refrigerant
	 Able to recover refrigerant
Renewal Term	5 Years
Notes	Include Automotive Specific Unit Standards, relating to refrigerants

Summary of Qualifications by Sector (Appendix B) Appliance Servicing Technician

Industry Sector	Appliances					
Qualification	New Zealand Certificate in Electrical Engineering (Electrical and					
	Electronic Installation and Service)					
Level	Level 4					
Course Term	3 year					
Class	Class 1 License					
Credits	180					
Variants	Strands in					
	Domestic Systems and Products					
	Commercial Equipment					
Purpose	The purpose of this qualification is to provide the electrical and					
	electronic service industry sectors with people who are able to install,					
	commission service and repair end- user electrical systems or product at					
	a complex level					
	This qualification is suitable for people who wish to advance their career					
	within the electrical industry. The Qualification includes three strands					
	that allow people to specialise further within this industry.					
	Graduates of this qualification will be able to work independently as					
	technicians and will be able to supervise electrical workers. They will					
	also be eligible to be registered and licensed as an Electrical Appliance					
	Serviceperson (endorsed to disconnect and connect) (EAS endorsed or as					
	an electrical service technician EST.					
Existing Unit	1966, 28950, 28952, 29563					
Standards						
Unit Standards to be	Leak testing - 28953					
developed/	Jointing - 2679, 23959					
redeveloped to meet						
future requirements						
Permitted Activity	 Able to service appliances containing refrigerant. Only includes 					
	system, not equipment permanently connected to the build					
	Power Supply					
	Able to purchase refrigerant					
	Able to recover refrigerant					
Renewal Term	5 Years					
Notes	Unit standards listed are relevant to technicians working with refrigerant					
	only.					

Summary of Qualifications by Sector (Appendix B) Trade Assistant

Industry Sector	Refrigeration and Air Conditioning
Qualification	New Zealand Certificate in Refrigeration & Air Conditioning (Trade
	Assistant)
Level	Level 3
Course Term	12 months (1 year)
Class	Class 1 License
Credits	120
Variants	N/A
Purpose	The purpose of this qualification is to provide the Refrigeration and Air- Conditioning (RAC) industry with people who have sufficient underpinning knowledge, understanding and practical skill to work as a Trade Assistant. This is an entry level qualification that is designed for people already working in the industry or people wishing to enter the industry as a Trae Assistant. Graduates will be able to perform limited assembly, installation and maintenance functions under the supervision of a qualified trades person.
Existing Unit Standards	19666, 29563
Unit Standards to be developed/ redeveloped to meet future requirements	Leak testing 28953 Jointing 2679, 23959
Permitted Activity	To handle a refrigerant while undertaking training and /or assessment in a classroom setting and at your wok-place under supervision. The supervisor must be the holder of a License and qualification that entitles them to engaged in work for which the licensee is being trained.
Renewal Term	5 Years
Notes	Unit standards listed are relevant to technicians working with refrigerant only.

Summary of Qualifications by Sector (Appendix B) Building Services Installer

Industry Sector	Refrigeration and Air Conditioning				
Qualification	New Zealand Certificate in Mechanical Building Services (Trade)				
Level	Level 4				
Course Term	3-4 years				
Class	Class 2 License				
Credits	280				
Variants	N/A				
Purpose	 The purpose of this qualification is to provide the construction and infrastructure sectors with skilled trades people who are able to safely and independently fabricate, assemble, install, commission and maintain mechanical service systems. Mechanical service systems may include environmental control systems air conditioning and heating systems; specialist ventilation and fluid conveyancing systems non-potable water systems; medical an laboratory gas systems. This qualification is designed for people working in the industry and will typically be achieved in a workplace environment whilst completing a New Zealand Apprenticeship. The 'Mechanical Building Services' industry was formally known as the 'Heating, Ventilation and Air Conditioning' industry. 				
Existing Unit Standards	19666, 22707, 23959, 26336, 28950, 28952, 29563, 31142				
Unit Standards to be developed/ redeveloped to meet future requirements	Leak testing 28953 Jointing 2679, 23959				
Permitted Activity	To handle a refrigerant while undertaking training and / or assessment in a classroom setting and at your workplace under supervision. The supervisor must be the holder of a license that entitles them to engage in work for which the licensee is being trained.				
Renewal Term	5 Years				
Notes	Unit standards listed are relevant to technicians working with refrigerant only.				

Summary of Qualifications by Sector (Appendix B) Air Conditioning Installer

Industry Sector	Air Conditioning					
Qualification	New Zealand Certificate in Air Conditioning Installation					
	(Proposed course with NZQA for approval)					
Level	Level 4					
Class	Class 3 License					
Course Term	18 months to 2 years					
Credits	140 Credit					
Variants	N/A					
Purpose	The purpose of this qualification is to provide the HVAC&R industry with skilled people who are able to independently install, ducted and non- ducted split/multi systems, packaged and heat pump Air Conditioning systems up to 50Kw nominal cooling, and who are working with Synthetic Refrigerants, including HFO's, in accordance with manufacturer's specifications and industry best practice.					
	This is an entry level qualification that is primarily designed for people already working within the industry and/or people that have another New Zealand allied trade qualification and wish to enter the HVAC&R industry, and/or people who have completed the New Zealand Certificate in Refrigeration and Air Conditioning (trade assistant) (Level 3) [Ref: 2365].					
Existing Unit Standards	19666, 22441, 23959, 22707, 28950, 28952, 28959, 29563, 31142					
Unit Standards to be developed/ redeveloped to meet future requirements	Leak testing28953Jointing2679, 23959					
Permitted Activity	 Able to purchase, install and de-commission air-conditioning plant and equipment UP TO 50KW Able to purchase refrigerant Able to recover refrigerant 					
Renewal Term	5 Years					
Notes	Unit standards listed are relevant to technicians working with refrigerant only.					

Summary of Qualifications by Sector (Appendix B) Commercial / Industrial Air Conditioning Refrigeration Technician (RAC)

Industry Sector	Refrigeration and Air Conditioning					
Qualification	New Zealand Certificate in Refrigeration and Air-Conditioning (Trade)					
Level	Level 4					
Class	Class 4 License					
Course Term	3 to 4 years					
Credits	280 Credits					
Variants	N/A					
Purpose	The purpose of this qualification is to provide the Refrigeration and Air Conditioning (RAC) industry with skilled tradespeople that are able to independently install, maintain, service and commission plant and equipment to industry standards. RAC plant and equipment may include: commercial air conditioning plant found in multi-story buildings; commercial refrigeration equipment similar to that found in a supermarket domestic refrigerators; heat/ energy recovery units; industrial single or multi-staged refrigeration and air-conditioning systems; or temperature and environmental control equipment in the food processing industry					
	This qualification will typically be achieved in a workplace environment whilst completing a New Zealand Apprenticeship					
Existing Unit Standards	3846, 3851, 3847, 19666, 23959, 28950, 28952, 28953, 28956, 28959, 28960, 28963, 28965, 28970, 29563					
Unit Standards to be developed/ redeveloped to meet future requirements	Leak testing - 28953 Jointing - 2679, 23959					
Permitted Activity	 Able to purchase, service , install and de-commission air conditioning and refrigeration equipment Able to purchase ALL refrigerants Able to recover refrigerant 					
Notes	Unit standards listed are relevant to technicians working with refrigerant only.					

Product Stewardship Scheme Training Refrigerant Unit Standards Explained (Appendix C)

Below are a summary of current Unit Standards relating to the use of Refrigerants for each sector of the industry, being; Automotive, Appliance Servicing, Trade Assistant (RAC), Building Services Installer, Air Conditioning Installer, Commercial / Industrial Air Conditioning Refrigeration Technician (RAC). Where the Unit Standard applies to all, All Sectors is noted.

These standards are referenced in the Matrix (Appendix A) and the Summary of Qualifications (Appendix B).

Unit	Title	Purpose	Credit	Level	Applied to
Standard					Course
981	Install an	This unit standard is for people in the automotive	3	3	Automotive
	Automotive Air	repair industry. People credited with this unit			
	Conditioning	standard are able to: install air conditioning cabin			
	System	components into a vehicle; install air conditioning			
		engine bay components; and charge and			
		performance test the air conditioning system.			
2679	Join metals using	This unit standard covers torch brazing and	6	3	ALL SECTORS
	the torch brazing	soldering of several metals using a gas torch. People			
	and soldering	credited with this unit standard are able to: prepare			
	processes	to join metals using the torch brazing and soldering			
		processes; join metals using the torch brazing and			
		soldering processes; and inspect and repair brazed			
		and soldered joints to industry standard.			
3397	Convert an	This unit standard is for people in the automotive	2	3	Automotive
	automotive air	repair industry. People credited with this unit			
	conditioning	standard are able to: evaluate condition of existing			
	system from R-12	air conditioning system on a vehicle; prepare air			
	to R-134a	conditioning system for retrofitting; convert an air			
		conditioning system for R-134a operation; and test			
		R134a air conditioning system operation.			
3846	Maintain	This unit standard is for people who work in the	20	3	RAC
	commercial	refrigeration and air conditioning sector of the			
	refrigeration	engineering industry. People credited with this unit			
	and/or air	standard are able to, for commercial refrigeration			
	conditioning	and/or air conditioning systems: review			
	systems	maintenance information; maintain the integrity of			
		lubrication, refrigerant, and air distribution systems,			
		and secondary heat transfer liquids; maintain the			
		integrity of mechanical components, thermal			
		insulation, heat transfer componentry, defrost			
		systems, and condensate drainage; calibrate and			
		test control and reporting systems; check and			
		maintain electrical components; and complete			
		maintenance activities and documentation, and			
		initiate follow-up actions.			
3851	Service commercial	This unit standard is for people who work in the	20	4	RAC
	refrigeration	refrigeration and air conditioning sector of the			
	and/or air	engineering industry. People credited with this unit			
		standard are able to, for commercial refrigeration			

	conditioning	and/or air conditioning systems: interpret system			
	systems	drawings and diagrams; diagnose faults and rectify			
		common faults in systems; retrofit existing systems			
		with alternative refrigerants; recondition			
		components; and complete servicing activities and			
		documentation, and recommission systems.			
3847	Maintain industrial	This unit standard is for people who work in the	20	4	RAC
	refrigeration	refrigeration and air conditioning sector of the			
	systems	engineering industry. People credited with this unit			
	-	standard are able to, for industrial refrigeration			
		systems: review maintenance information; maintain			
		the integrity of lubrication, refrigerant, and air			
		distribution systems, and secondary heat transfer			
		liquids: maintain the integrity of mechanical			
		components, thermal insulation, heat transfer			
		componentry, defrost systems, and condensate			
		drainage: calibrate and test control and reporting			
		systems: check and maintain electrical components:			
		and complete maintenance activities and			
		documentation and initiate follow-up actions			
19666	Demonstrate	This unit standard is for people who work in the	4	3	All Sectors
15000	knowledge of	Refrigeration and Air Conditioning (RAC) industry	-	5	
	refrigerants and	installing servicing modifying or dismantling			
	their effect on the	equinment containing Ozone Denleting Refrigerants			
	environment	(ODRs) or Synthetic Greenhouse Gases (SGGs)			
		People credited with this unit standard are able to:			
		demonstrate knowledge of stratospheric ozone and			
		its role in the atmosphere: demonstrate knowledge			
		of the effect of refrigerants on the atmosphere			
		demonstrate knowledge of ozone layer protection			
		legislation and codes of practice: identify OD			
		substances and SGGs used as refrigerants and			
		describe safe methods of identification: and			
		demonstrate knowledge of procedures to reduce			
		ODB and SGG emissions in refrigeration and air			
		conditioning practice			
22441	Demonstrate	This unit standard is for the training of installers of	5	3	Aircon
22111	knowledge of split	split system air conditioning, and covers	0	•	/
	system air	underpinning principles and their application.			
	conditioning	People credited with this unit standard are able to			
	principles and	demonstrate knowledge of refrigerants and their			
	applications	hazards; electrical hazards and electrical work			
		relevant to split system air conditioning; physics			
		related to air conditioning; the refrigeration cycle;			
		types of split system air conditioning; and air			
		conditioning principles as they relate to human			
		comfort			
22707	Install commercial	This unit standard is for people who work in the	20	4	Build Serv/
_	refrigeration	refrigeration and air conditioning sector of the			Aircon
	and/or air	engineering industry. People credited with this unit			
	conditioning	standard are able to, for commercial refrigeration			
	systems	and/or air conditioning systems, prepare for the			
		installation; and install the components and			
		complete documentation			
23959	Prepare and purge	This unit standard is for use in training of	4	3	Appliance/
	braze piping for	refrigeration and air conditioning technicians and			Trade

	refrigeration and air conditioning	covers preparation and purge brazing of copper piping up to 25 mm diameter for refrigeration and air conditioning systems. This standard is not intended for use in the appliance servicing industry. People credited with this unit standard are able to:			Assistant/ Build Serv/ Aircon/ RAC
		demonstrate knowledge of welding safety relevant to brazing of piping; prepare for purge brazing of piping: and join piping using purge brazing			
24443	Service and rectify	This unit standard is for people in the automotive	7	4	Automotive
	faults in an	repair industry. People credited with this unit			
	automotive air	standard are able to service and rectify faults in an			
	conditioning	automotive air conditioning system.			
	system				
24444	Service and rectify	This unit standard is for people in the automotive	7	4	Automotive
	faults in an	repair industry. People credited with this unit			
	automotive air	standard are able to service and rectify faults in an			
	conditioning	automotive air conditioning system.			
	system		_		
24445	Remove and	This unit standard is for people in the automotive	2	3	Automotive
	replace automotive	repair industry. People credited with this unit			
	air conditioning	standard are able to remove and replace air			
	components	compartment, and engine hav			
24446	Demonstrate	This theory based unit standard is for people in the	1	1	Automotive
24440	knowledge of	automotive industry. People credited with this unit	7	-	Automotive
	preparing to test.	standard are able to demonstrate knowledge of			
	and testing for	preparing to test an automotive air conditioning			
	faults in an	system for operation, and testing for faults in an			
	automotive air	automotive air conditioning system.			
	conditioning				
	system				
24447	Recover refrigerant	This unit standard is for people in the automotive	2	3	Automotive
	from, and evacuate	repair industry. People credited with this unit			
	and charge an	standard are able to: recover refrigerant from;			
	automotive air	evacuate; and charge an automotive air conditioning			
	conditioning	system.			
24442	system		2	2	A 1 11
24448	Demonstrate	This theory-based unit standard is for people in the	2	3	Automotive
	knowledge of	this unit standard are able to demonstrate			
	servicing	knowledge of: recovering refrigerant and			
	conditioning	compressor oil from an automotive air conditioning			
	systems	system: flushing an automotive air conditioning			
		system; evacuating an automotive air conditioning			
		system; charging an automotive air conditioning			
		system; and testing an automotive air conditioning			
		system for leaks.			
24449	Prepare to test, and	This unit standard is for people in the automotive	2	3	Automotive
	test an automotive	repair industry. People credited with this unit			
	air conditioning	standard are able to: prepare to test an automotive			
	system for leaks	air conditioning system for leaks; and test an air			
		conditioning system for leaks using a vacuum gauge,			
		electronic leak detector, ultra-violet (UV) detection			
24454	Increat and comiles	uyes, dilu illu ogen. This unit standard is far noonla in the sutemative	2	2	Automotivo
24451		renair industry. People credited with this unit	2	5	Automotive

	conditioning	standard are able to inspect air conditioning			
	equipment	equipment for condition, and service air			
		conditioning equipment.			
24452	Inspect and service	This unit standard is for people in the automotive	2	3	Automotive
21132	automotive air	repair industry. People credited with this unit	-	Ũ	
	conditioning	standard are able to inspect air conditioning			
	equipment	equipment for condition and service air			
	equipment	conditioning equipment			
26336	Demonstrate	This unit standard is intended primarily for use in	8	3	Building Serv
20330	knowledge of the	the training of personnel in the heating ventilating	Ũ	3	Building Serv
	components used	and air conditioning (HVAC) industry and covers			
	in heating	principles of HVAC components and their			
	ventilating and air	application. People credited with this unit standard			
	conditioning	are able to demonstrate knowledge of the			
	systems	components used in HVAC systems and seismic			
	Systems	restraints on HVAC system components in			
		accordance with N7S 4219			
28050	Meet requirements	This unit standard is for people working in the	3	3	Automotive/
28930	for Approved Filler	refrigeration and air conditioning industry who need	5	5	Annliance/
	Test Certificate for	to fill gas cylinders with refrigerants. It covers the			Build Serv/
	refrigerants	knowledge and practical skills required to prepare			Aircon/ BAC
	reingerants	candidates for an Annroved Filler Test Certificate for			
		Class 2 refrigerants as required by legislation People			
		credited with this unit standard are able to identify			
		legislation and regulations relating to the activities			
		of Approved Fillers: demonstrate knowledge of			
		compressed gases used as refrigerants and of			
		associated cylinders and valves: and perform			
		refrigerant recovery procedures			
28052	Demonstrate	This unit standard is for people who work or intend	5	3	All sectors
20952	knowledge of	to work in the refrigeration and air conditioning	5	5	All Sectors
	refrigerants and	sector of the engineering industry. It covers			
	their management	foundation knowledge of refrigerants to undernin			
	then management	their safe handling and the safety of operators			
		People credited with this unit standard are able to			
		demonstrate knowledge of: the physical properties			
		of commonly used refrigerants: refrigerant			
		classifications: safe methods of identifying			
		refrigerants: the bazards associated with			
		refrigerants, and their management: gas cylinders			
		and their safety features for use with refrigerants:			
		standard industry practices for handling			
		refrigerants: and legislation and codes of practice			
		for the use and management of refrigerants.			
28953	Demonstrate	This unit standard is for use in the later stages of	5	4	Appliance/
20555	advanced	training of apprentices in the refrigeration and air	•		Trade
	knowledge of	conditioning trade, and covers more advanced			Assistant/
	refrigerants and	knowledge of the use and management of			Build Serv/
	their management	refrigerants. People credited with this unit standard			Aircon/ RAC
		are able to demonstrate knowledge of: pressure-			,
		enthalpy diagrams for refrigerants, refrigeration oil.			
		the effect of moisture in refrigerant and its			
		management, methods of detecting refrigerant			
		leakage, Approved Handler certification. retrofitting.			
		and HC refrigerants; and demonstrate knowledge of			

		changes to industry procedures as a result of the			
		Tamahere cool store fire.			
28956	Maintain and	This unit standard is for people who maintain and	20	4	RAC
	service RAC	service commercial refrigeration and air			
	systems and	conditioning (RAC) equipment in transport			
	equipment in	applications. People credited with this unit standard			
	controlled	are able to: prepare to maintain and service RAC			
	temperature	systems, maintain and service RAC mechanical			
	transport	systems and components, repair faults in RAC			
	applications	mechanical systems and components, maintain and			
	approations	service RAC electrical and electronic systems and			
		components, repair faults in RAC electrical and			
		electronic systems, retrofit refrigerants, and			
		complete maintenance and/or servicing activities			
28970	Demonstrate	This unit standard is for people who work or intend	15	3	RAC
20570	knowledge of the	to work in the refrigeration and air conditioning	15	5	NAC .
	nrinciples of	sector of the engineering industry. It covers the			
	refrigeration and	hasic principles of refrigeration and air conditioning			
	air conditioning	and their application, and is intended for use in the			
		training of installers and technicians of refrigeration			
		and air conditioning equipment. People credited			
		with this unit standard are able to domonstrate			
		knowledge of physics related to refrigeration and			
		air conditioning: the refrigeration cycle:			
		an conditioning, the reingeration cycle,			
		hasis principles of cold food storage, and establish			
		basic principles of cold food storage; and establish			
		operating parameters of a small refrigeration system			
20050	Demonstrate	This is an entry level with far a scale working in the	0	2	Aires (DAC
28959	Demonstrate	I his is an entry level unit for people working in the	8	3	Aircon/RAC
	knowledge of	retrigeration and air conditioning (RAC) industry.			
	Installation and	People credited with this unit standard are able to:			
	commissioning	demonstrate knowledge of pre-installation			
	procedures for	activities; describe standard procedures for			
	commercial RAC	installing systems and components; describe system			
	equipment	evacuation and charging procedures; describe			
		records for a commissioned RAC system.	-		
28960	Demonstrate	This unit standard is for people working in the	8	3	RAC
	knowledge of	refrigeration and air-conditioning (RAC) industry.			
	commercial RAC	People credited with this unit standard are able to			
	system	explain the need for routine maintenance on RAC			
	maintenance and	systems and equipment, and describe maintenance			
	servicing	and testing procedures for RAC systems,			
28963	Install commercial	This unit standard is intended for people working in	8	3	RAC
	RAC equipment	the refrigeration and air conditioning (RAC) sector of			
	under supervision	the engineering industry. People credited with this			
		unit standard are able to, under supervision;			
		prepare to install RAC components and systems, and			
		install RAC system components.			
28965	Maintain and	This unit standard is for people working in the	12	3	RAC
	service commercial	refrigeration and air conditioning (RAC) industry			
	RAC systems and	under supervision. People credited with this unit			
	equipment under	standard are able to; prepare to maintain and			
	supervision	service commercial RAC systems, maintain and			
		service RAC mechanical systems and components,			
		maintain and service RAC electrical and electronic			

		systems and components, retrofit refrigerants, and			
205.62	Demonstrate	complete maintenance and servicing activities.	2	2	All Costors
29563	Demonstrate	flammable refrigerants in refrigeration and air	3	3	All Sectors
	flowmable	naminable reingerants in reingeration and air			
	fiammable	this unit standard are able to demonstrate			
	reirigerants used in	this unit standard are able to demonstrate			
	refrigeration and	knowledge of legislation, standards and codes			
	air conditioning	relating to hammable refrigerants; hammable			
	industries	reingerants; the health and safety risk factors to be			
		refrigerents, presedures when werking with			
		flammable refrigerants; and amorgonay and first aid			
		naminable reingerants; and, emergency and first and			
20577	Demonstrate	This theory based unit standard is for people who	4	2	Automotivo
29577	Demonstrate	This theory-based unit standard is for people who	4	3	Automotive
	knowledge of	wish to enter of are employed in the collision repair			
	removing and	able to demonstrate knowledge of removing and			
	rentung	refitting automotive air conditioning, cooling and ail			
	automotive an	renting automotive an conditioning, cooling and on			
	cooling and oil	cooling system components.			
	cooling system				
	components				
30565	Demonstrate	This unit standard is for people who wish to enter or	4	3	Automotive
30303	knowledge of an	are employed in the motor industry. People credited	7	5	Automotive
	automotive air	with this unit standard are able to demonstrate			
	conditioning	knowledge of refrigeration principles and an			
	system	automotive air conditioning system.			
31124	Diagnose and	People credited with this unit standard are able to	6	4	Automotive
	repair faults in an	diagnose and repair faults in an automotive climate			
	automotive air	control system.			
	conditioning				
	system				
31127	Demonstrate	People credited with this unit standard are able to	3	3	Automotive
(24450)	knowledge of an	demonstrate knowledge of an automotive climate			
. ,	automotive climate	control system and repair faults.			
	control system				
31142	Demonstrate	This unit standard is intended primarily for use in	3	3	Building
	knowledge of	the training of personnel in the mechanical building			Serv/ Aircon
	refrigerants and	services industry. It covers basic knowledge of			
	their use in	refrigerants and the legislative requirements for			
	mechanical	their use in mechanical building services. People			
	building services	credited with this unit standard are able to			
		demonstrate knowledge of: legislation, codes of			
		practice, and the management of hazards associated			
		with retrigerants; commonly used refrigerants; the			
		effect of refrigerants on the atmosphere. Learners			
		are also able to recognise and interpret refrigerant			
		labelling and take precautions when handling			
		retrigerants.			

Signature:	CA
Name:	Carl Easton
Organisation:	Temperzone
Date:	5 May 2020

Once all participants in the Working Group have signed off the report it will be sent to MfE for comment then made available to all stakeholders via the Synthetic Refrigerant Stewardship website.

Signature:		
Name:	CHRISANE JOHNSPN	
Organisation:	IRHACE.	
Date:	tet may 2020.	-

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Signature:

Name:

Date:

Organisation:

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Signature:	X/Kbden	
Name:	Harry Dadson	
Organisation:	APIA	
Date:	5/5/2020.	

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Signature:	Bagett
Name:	lan Baggott
Organisation:	MTA
Date:	5/5/20

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Signature:		
Name:	Ivan Tottle	
Organisation:	Chemiplas NZ Ltd	
Date:	8 May 2020	

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Signature:	
Name:	John Bowen
Organisation:	Refrigerant Recovery
Date:	4 th May 2020

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Signature:

Name:

Date:

Leo S. Mortimer

Organisation:

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Signature:

Name:

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Organisation:

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Date:

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Signature:	- fth
Name:	Peter Hutson
Organisation:	HPSA,
Date:	7/5/2020

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Signature:	Magn
Name:	hob Mirgan
Organisation:	CCCANZ
Date:	5/5/20

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Signature:	les/.
Name:	Robert Wyon
Organisation:	REPRIANEDUS LICENCI NZ
Date:	5.5.2020

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Please scan and email this page to darren@3R.co.nz

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