Red Stripe Safety Bulletin

Dangerous Occurrence
Uncontrolled Ammonia Release

When: 20th January 2016 Where: Customer Site Location No: 16/035

Potential Injury Description:

Ammonia vapor inhalation and/or burns.

Incident Details:

Whilst starting to purge ammonia vapour from a compressor package into water, two J & E Hall engineers allowed an un-controlled ammonia release as the pipe fell out of the water IBC container briefly and allowed ammonia vapour to be release into a pedestrian area. Two members of the site's staff were stood across the road (approximately 15 / 20 metres from the purging vessel). After the event they asked one of the engineers what was being purged and the engineer told them that it was ammonia. One guy then walked across site and reported that he had been covered in ammonia vapour.

J & E Hall engineers have stated that the incident happen as they started work, one engineer was at the purge valve on the compressor and the other engineer by the water IBC container, (eight to ten metres apart) as the engineer opened the purge valve the un-fixed purge hose was pushed out of the water causing the ammonia vapour release, at this point the engineer shouted to the other engineer and the ammonia purge valve was shut.

A second incident had also been raised by the customer:

The customer site contact had contacted the service centre manager to state that the engineers had left the system purging ammonia into the water overnight, so it would be clear in the morning for them to start work on the compressor. The service centre manager therefore rang the engineers and got them to turn around and go back to site to isolate the purging.

Root Causes:

- The hose was not affixed to the IBC container
- The J & E Hall risk assessment and method statement had not been signed as read and understood by the engineers
- The working area was not cordoned off and no safety warning signage was put on display, as per the issued J & E Hall risk assessment and method statement documents issued to the engineers and site
- As the engineers had been purging ammonia for at least six hours the previous day, the 1000 litre IBC container of water could have been saturated with ammonia, thus when the ammonia purge valve as opened the next day, the water would not have absorbed the ammonia, thus forcing the hose out of the water
- If the engineer opened the purge valve too aggressively, then this and the above saturated water could have driven the hose out of the water, blowing ammonia vapour across the un-cordoned pedestrian area
- Uncontrolled and unsupervised purging of ammonia should it have been left as intended by the engineers overnight

Corrective Actions:

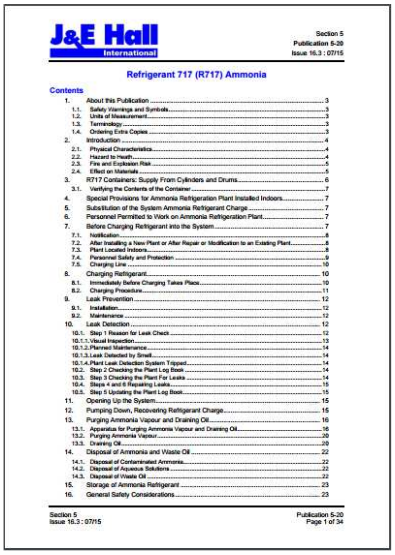
- Local discussion with engineers concerned
- Feedback to the customer and site over incident and share corrective actions raised
- Issue of Red Stripe Safety Bulletin to form a toolbox talk to be delivered to all service engineers at all service business offices
- Service managers & supervisors to review risk assessments, method statements and safe work instructions issued to ensure all hazards are identified, controlled and highlighted to their respective engineers and any feedback shared; reference to J & E Hall Procedure Publication 5-020 R717
- Engineers (Point of Work) Site Risk Assessment to be used
- Risk Assessment training to be delivered to all service & contract business engineers
- The affixing of the purge hose to the water container used during purging activities

Key Leanings:

- Risk assessments & method statements to be agreed and adhered to at all times
- The cordoning off and use of safety warning signs when carrying out any purging of Ammonia to warn others of the potential hazards & risks
- Under no circumstances should the purging of Ammonia be left unsupervised

References:

- J & E Hall Procedure Publication 5-020 R717 (Ammonia) issue 16.3 07-15 section 13
- JEH/SWI/R55
- Engineers Site Risk Assessment JE0057


J&E Hall International

Section 5
Publication 5-20
Issue 16.3 : 07/15

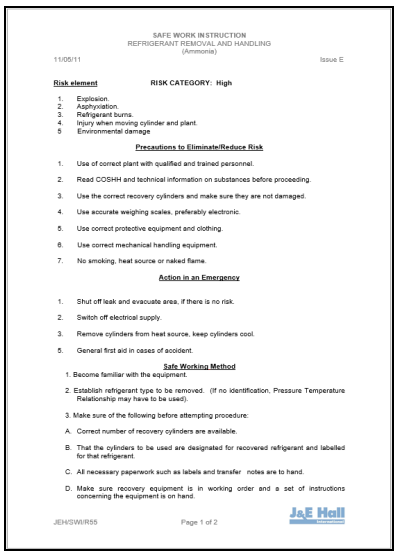
Refrigerant 717 (R717) Ammonia

Contents

1. About this Publication ... 3
1.1. Safety Warnings and Symbols ... 3
1.2. Units of Measurement ... 3
1.3. Terminology ... 3
1.4. Ordering Extra Copies ... 3
2. Introduction ... 4
2.1. Physical Characteristics ... 4
2.2. Hazard to Health ... 4
2.3. Fire and Explosion Risk ... 5
2.4. Effect on Materials ... 5
3. R717 Containers: Supply From Cylinders and Drums ... 6
3.1. Verifying the Contents of the Container ... 7
4. Special Provisions for Ammonia Refrigeration Plant Installed Indoors ... 7
5. Substitution of the System Ammonia Refrigerant Charge ... 7
6. Personnel Permitted to Work on Ammonia Refrigeration Plant ... 7
7. Before Charging Refrigerant into the System ... 7
7.1. Notification ... 8
7.2. After Installing a New Plant or After Repair or Modification to an Existing Plant ... 8
7.3. Plant Located Indoors ... 8
7.4. Personnel Safety and Protection ... 9
7.5. Charging Line ... 10
8. Charging Refrigerant ... 10
8.1. Immediately Before Charging Takes Place ... 10
8.2. Charging Procedure ... 11
9. Leak Prevention ... 12
9.1. Installation ... 12
9.2. Maintenance ... 12
10. Leak Detection ... 12
10.1. Step 1 Reason for Leak Check ... 12
10.1.1.Visual Inspection ... 13
10.1.2.Planned Maintenance ... 14
10.1.3.Leak Detected by Smell ... 14
10.1.4.Plant Leak Detection System Tripped ... 14
10.2. Step 2 Checking the Plant Log Book ... 14
10.3. Step 3 Checking the Plant For Leaks ... 14
10.4. Steps 4 and 5 Repairing Leaks ... 15
10.5. Step 5 Updating the Plant Log Book ... 15
11. Opening Up the System ... 15
12. Pumping Down, Recovering Refrigerant Charge ... 15
13. Purging Ammonia Vapour and Draining Oil ... 16
13.1. Apparatus for Purging Ammonia Vapour and Draining Oil ... 16
13.2. Purging Ammonia Vapour ... 20
13.3. Draining Oil ... 20
14. Disposal of Ammonia and Waste Oil ... 22
14.1. Disposal of Contaminated Ammonia ... 22
14.2. Disposal of Aqueous Solutions ... 22
14.3. Disposal of Waste Oil ... 22
15. Storage of Ammonia Refrigerant ... 23
16. General Safety Considerations ... 23

Section 5
Issue 16.3 : 07/15

Publication 5-20
Page 1 of 34


SAFE WORK INSTRUCTION
REFRIGERANT REMOVAL AND HANDLING
(Ammonia)

11/05/11 Issue E

Risk element **RISK CATEGORY: High**

1. Explosion.
2. Asphyxiation.
3. Refrigerant burns.
4. Injury when moving cylinder and plant.
5. Environmental damage

Precautions to Eliminate/Reduce Risk

1. Use of correct plant with qualified and trained personnel.
2. Read COSHH and technical information on substances before proceeding.
3. Use the correct recovery cylinders and make sure they are not damaged.
4. Use accurate weighing scales, preferably electronic.
5. Use correct protective equipment and clothing.
6. Use correct mechanical handling equipment.
7. No smoking, heat source or naked flame.

Action in an Emergency

1. Shut off leak and evacuate area, if there is no risk.
2. Switch off electrical supply.
3. Remove cylinders from heat source, keep cylinders cool.
5. General first aid in cases of accident.

Safe Working Method

1. Become familiar with the equipment.
2. Establish refrigerant type to be removed. (If no identification, Pressure Temperature Relationship may have to be used).
3. Make sure of the following before attempting procedure:

A. Correct number of recovery cylinders are available.

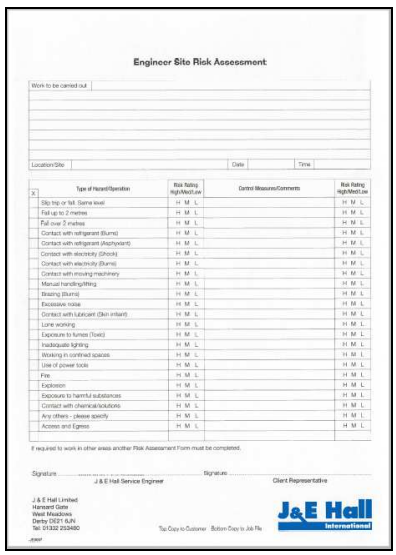
B. That the cylinders to be used are designated for recovered refrigerant and labelled for that refrigerant.

C. All necessary paperwork such as labels and transfer notes are to hand.

D. Make sure recovery equipment is in working order and a set of instructions concerning the equipment is on hand.

J&E Hall

JEH/SWI/R55 Page 1 of 2


Engineer Site Risk Assessment

Work to be carried out

Location/Site Date Time

X	Type of Hazard/Operation	Risk Rating High/Med/Low	Control Measures/Comments	Risk Rating High/Med/Low
	Slip trip or fall. Same level	H M L		H M L
	Fall up to 2 metres	H M L		H M L
	Fall over 2 metres	H M L		H M L
	Contact with refrigerant (Burns)	H M L		H M L
	Contact with refrigerant (Asphyxiant)	H M L		H M L
	Contact with electricity (Shock)	H M L		H M L
	Contact with electricity (Burns)	H M L		H M L
	Contact with moving machinery	H M L		H M L
	Manual handling/lifting	H M L		H M L
	Brazing (Burns)	H M L		H M L
	Excessive noise	H M L		H M L
	Contact with Lubricant (Skin irritant)	H M L		H M L
	Lone working	H M L		H M L
	Exposure to fumes (Toxic)	H M L		H M L
	Inadequate lighting	H M L		H M L
	Working in confined spaces	H M L		H M L
	Use of power tools	H M L		H M L
	Fire	H M L		H M L
	Explosion	H M L		H M L
	Exposure to harmful substances	H M L		H M L
	Contact with chemical/solutions	H M L		H M L
	Any others - please specify	H M L		H M L
	Access and Egress	H M L		H M L

If required to work in other areas another Risk Assessment Form must be completed.

Signature ..... Signature .....

J & E Hall Service Engineer Client Representative

J & E Hall Limited
Hansard Gate
West Meadows
Derby DE21 6JN
Tel: 01332 253480

Top Copy to Customer - Bottom Copy to Job File

J&E Hall International

This document is available on the J&E Hall web site/My J&E Hall/HSQE area/Health & Safety/Safety bulletin

Please contact the HSQE Function for further support & guidance

E-mail: mark.eastburn@jehall.co.uk
Tel: Mobile: 07801 301017 Landline: 01332 253404

Mark Eastburn
HSQE Manager