
Portable Pressure Hose Safety

Document Number – OHS-PROC-120

This document applies to the following sites:

Brisbane Office	<input type="checkbox"/>	Meandu Mine	<input type="checkbox"/>	Stanwell PS	<input checked="" type="checkbox"/>
Tarong Site	<input checked="" type="checkbox"/>	Wivenhoe Pipeline	<input type="checkbox"/>		

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1.0 Purpose/Scope

This Business Procedure describes Stanwell's minimum mandatory requirements for the use and management of portable pressure hoses including retractable hose reels.

This Business Procedure applies throughout Stanwell, all its sites and all activities under Stanwell's control. It applies to all Stanwell employees and contractors, including visitors to Stanwell workplaces.

This Business Procedure does not apply to:

- hoses or flexible hoses which are permanently installed on fixed plant or powered mobile plant;
- hoses associated with hot work equipment (e.g. plasma cutters);
- hoses associated with self contained breathing apparatus (SCBA) equipment;
- low pressure water hoses (e.g. garden hose);
- vacuum cleaning hoses; and
- fire hoses (lay flat).

2.0 Actions

The following applies:

- The standards to be met for hose and fittings, and the quality assurance required, should be clearly nominated prior to purchase for each item.
- Only approved connections, fittings, clips etc. are used and are compatible and used as per the manufacturer's instructions. Worm drive and 'o' clips are not approved for use.

Portable pressure hoses shall be classified and used according to their rated maximum working pressure and duty.

Specifications for specialist portable pressure lines, including hydraulic and chemical lines should be referred to a competent Engineer.

The following shall occur:

- prior to use, portable pressure hoses and associated components are inspected by a competent person, including checks for any cracks, cuts, bulges, kinks, splits, perished or degraded sections, corroded fittings, loose or damaged ends, damaged threads or quick release fittings;
- all portable pressure hoses made on site are to be constructed by a competent person and inspected prior to use;
- portable pressure hoses and associated components identified as being damaged are removed from serviced, tagged out and repaired by a competent person;
- an airline tail must be installed on all impact pneumatic tools. The tail must only have one fitting connecting the hose to the tool (multiple fittings at the tool are not permitted);
- brass airline fittings are not to be used on portable pressure hoses or equipment, unless specifically approved as suitable by a competent person, or when in retractable hose reels installed by the manufacturer;
- unless high air flow is integral to the performance of the activity (e.g. for tasks such as lancing), the portable air pressure line shall have an air fuse fitted. Note: Where an air fuse is not used, a whipcheck shall be fitted to the airline;
- portable air pressure lines shall be fitted with external whipchecks in accordance with section 2.2.1.

Specific requirements for the use of High Pressure Water Jetting Systems (HPWJS) with an output capability greater than 800 bar litres per minute are not specifically referenced within this procedure. If HPWJS are used on site the following must occur:

- HPWJS must comply with the requirements of AS/NZS 4233.2 High pressure water jetting systems Part 2: Construction and performance
- HPWJS must be operated safely and maintained in accordance with AS/NZS 4233.1 High pressure water jetting systems Part 1: Safe operation and maintenance.
- Class B Operators of HPWJS must have received and have evidence of suitable training delivered by an RTO (*as per section 3*).

2.1 Use of Hoses

- Hoses shall be positioned such that they do not create a trip hazard.
- Where practicable, hoses should be depressurised prior to adjusting any fittings or connections.
- Compressed air or fluids shall not to be directed towards the user or another person.

2.2 Safety Devices

2.2.1 Pressure Hose Restraints (Whipchecks)

Pressure hose restraints, i.e. 'whipchecks', shall be fitted to air hose connections where the internal hose diameter is greater than or equal to 20mm (1 inch) and the operating pressure is greater than or equal to 700kPa, or where there is a risk of injury to workers resulting from pressure hose or connection failure, as identified by a risk assessment.

Whipchecks shall be constructed of woven stainless steel, steel wire rope, chain or similar material appropriate to the minimum strength rating required. Whipchecks must be installed by placing them in a fully extended position with no slack to ensure the potential for whip is minimised.

Recommended minimum strength requirements for stocking type whipchecks for compressed air hoses are shown in Table 2 below.

Looped cable safety whipchecks are to be used in accordance with the manufacturers recommendations for pressures below 1400kPa (200PSI). The rating for this type of whipcheck is 5.7kN (580Kgf), unless specifically identified by the manufacturer. The looped cable safety whipcheck must be used as directed by the manufacturer and checked by a competent person prior to use.

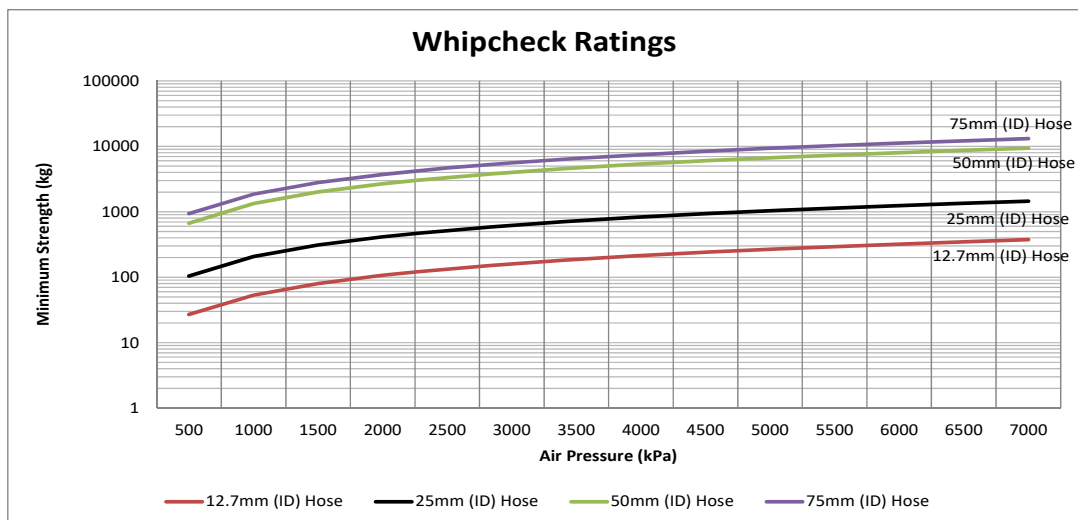


Table 2 Recommended Minimum Strength Requirements for Stocking Type Whipchecks¹

Non-air hose connections shall implement safety devices relevant to the whip hazard, i.e. HPWJS systems should use 'Braided Stockings' rather than whipchecks, while hydraulic pressure hose connections should be assessed based on risk as hydraulic oil is non-compressible and does not generally induce hose whip during a coupling or hose failure.

External whipchecks with eyelets requiring shackles shall be fastened to a suitable mounting point, supplied for that purpose with shackles or other appropriate fittings. The shackles shall be rated to the same or greater strength than that of the whipcheck.

Note: Where any doubt exists regarding the suitability of a whipcheck, mounting point and/or associated shackles and fittings, a suitably qualified and experienced engineer or technical specialist shall be consulted to ensure the suitability of the restraint configuration.

Mounting points shall be positioned in an appropriate location, protected from damage and excess wear.

Where an application requires two hoses to be joined together this is to be accomplished by either:

- fitting each hose with a separate whipcheck and shackling the two together; or
- using one whipcheck to overlap the joint.

2.2.2 Air Fuses

Air fuses shall be used to ensure that air flow ceases in the event of a rupture or breakage in the air hose or failure of a hose fitting. Air fuses are available in various sizes and in either a standard or high flow rate. Air fuse manufacturer specification shall be used to determine the correct rating of air fuses in consideration to air hose length, air supply pressure and air flow rates.

Before using an air hose fitted with an air fuse it is important to check that the air fuse is rated for the tooling being used. The air demand from the tool must not be greater than the cut-off flow of the air fuse.

Air fuses shall:

- be installed directly between fixed or rigid pipework and the flexible hose to protect the whole length of the flexible hose (only the hose after the air fuse is protected). The length of the protected air hose must not exceed the rating of the air fuse;
- be installed in the correct orientation; and
- be installed after any size reduction couplings at the mains.

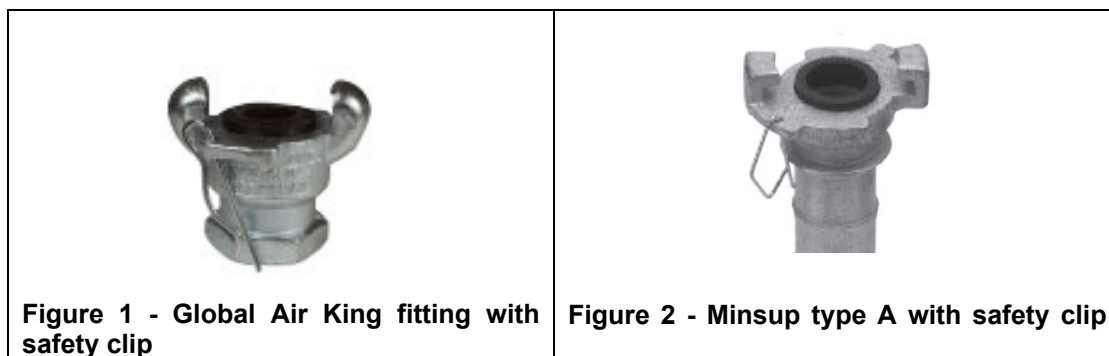
Test that the air fuse is offering protection before starting the job ensuring that the end of the hose is secure.

Air fuses are not required where full air flow is integral to the performance of the activity e.g. air lancing and use of purge compressors. Where an air fuse is not used, a whipcheck shall be fitted to the airline as per section 2.2.1.

2.2.3 Safety Clips

Safety clips shall be used on all claw type fitting connections; e.g. Minsup and Global Air King.

¹ Table 2 Derived from calculation Force = Pressure x Area and includes a safety factor based on recommendations from 'Restraint devices for high pressure flexible air hoses', RJ (Bob) Mulligan April 1998.



3.0 Training and Competence Requirements

The competency requirements for the provision of technical support or engineering advice is as follows:

- An engineering approach that is risk-based should be used. The concepts for assessing portable pressure hose risks are similar to those used for other pressure equipment – e.g. the class of hose, the hazardous nature of the contents, the pressure, temperature and volume of the fluid, the amount of stored energy involved, the nature of the application, and the level of risk to personnel, the environment and other equipment.

Competency requirements for using high pressure water jetting system (HPWJS) are as follows:

- All workers must be trained and deemed competent prior to use of any HPWJS, with refresher training delivered not exceeding two years to ensure continued competency of operators.
- Class B operators must be trained by an authorised Registered Training Organisation (RTO) in accordance with the requirements of AS/NZS 4233.1 High pressure water jetting systems. Workers must also be inducted in relation to any specific equipment they are given to use.

4.0 Responsibilities

The competent person is responsible for assembling, testing, inspecting and assessing the fitness-for-purpose and fitness-for-service of portable pressure hoses and fittings.

The *Manager Technical Services* is responsible for the provision of corporate engineering support to generation sites.

The relevant site Engineer is responsible for the provision of technical support to the competent persons at generation sites.

5.0 Review, Communication and Communication

Review:

This Document is required to be reviewed, as a minimum, every 5 years.

Consultation:

The review and update of this document will be done in consultation with the Corporate Health & Safety Team.

Communication/Requirements after Update:

No specific communication is required or this document.

6.0 References

Source	Reference
Legislation	<ul style="list-style-type: none"> Queensland Work Health and Safety Regulation 2011, s224
Australian Standards	<ul style="list-style-type: none"> AS/NZS 4233.1:2013 High pressure water jetting systems Part 1: Safe operation and maintenance AS/NZS 4233.2:2013 High pressure water jetting systems Part 2: Construction and performance
Stay Safe	<ul style="list-style-type: none"> OHS-PROC-120A - Portable Pressure Hoses
Tools	<ul style="list-style-type: none"> Nil

7.0 Definitions

Term	Meaning
Pressure hose	A complete fluid or air transfer system comprising portable flexible hose and attached adaptors, end connectors, clamps/swages and securing devices.
Whipcheck	A hose restraint device which is fitted to a pressure hose to minimise uncontrolled movement of the hose in the case of hose coupling or connection failure. Whipchecks are to be fitted in accordance with manufacturer's specifications.
Air fuse	A fixed, unidirectional automatic shut off valve inserted in-line within an air delivery system. If a sudden rupture occurs in a compressed air system or hose, the air fuse automatically cuts off the air supply when the air flow exceeds a set value.
Competent person	A person who has through a combination of training (trade background and / or specific training in hose design, standards, manufacturing and application principles), education and experience, acquired the knowledge and skills enabling that person to correctly perform the specified task.
Airline tail	An appropriately sized section of air hose connecting an air powered tool to the main air hose; preventing the need for reducers etc. at the tool itself. The airline tail reduces vibration and side loading on the quick connect fitting.
High pressure water jetting	<p>High pressure water jetting is a process using a stream of pressurised water to remove material, coatings or contamination and debris from the surface of a work piece or material substrate including:</p> <ul style="list-style-type: none"> - high pressure water jetting systems pressurised by positive displacement pumps with an output capability greater than 800 bar litres per minute, and - water jetting systems operating below 800 bar litres per minute where there is a foreseeable risk of injury to operators or other people.

8.0 Acronyms

Term	Meaning
ID	The internal diameter of hose
OD	The external diameter of hose
psi	Pound-force per square inch (imperial unit of pressure measurement). Pound(s) per square inch is also a recognised term. The symbol is lbf/in ² or abbreviated to psi.
kPa	Kilopascal (SI unit of measurement). Unit of pressure measurement.
kN	Kilo Newtons (SI unit of measurement). Derived unit of force.
Kgf	Kilogram force (SI unit of measurement). Gravitational unit of force.

9.0 Revision History

Rev. No.	Rev. Date	Revision Description	Author	Endorse/Check	Approved By
0	27.10.2014	Document issued	Jason Paull	Michael Joy Trevor Hooper	Ian Gilbar
1	30.01.2019	Reference to 'only high flow air fuses shall be used' has been deleted.	Jan Fullard	Jason Paull	Kriss Ussher
2	29.05.2020	Revised to reflect changes to Australian Standards. Review completed by site subject matter experts taking into consideration findings and recommendations identified during the Site Safety Process Control Audit – Portable Pressure Hose Safety (AUD-11556) undertaken across SCL sites in February-March 2020.	Lindsay Jahn	Jason Paull	Kriss Ussher
3	31.08.2020	Section 2.2.1 revised to reflect prescribed requirement for whipchecks	Lindsay Jahn	Jason Paull	Kriss Ussher
4	31.08.2022	Sections 2.0 and 3.0 updated to include High Pressure Water Jetting System selection, operation, maintenance and training compliance requirements .	Trent Hoare	David Weber	Letitia Lucke

10.0 Appendices

Appendix A Portable Pressure Hose Document Flowchart

