The Four Elements to Successfully Manage Your Confined Spaces

Confined spaces can be complicated and anyone, in any industry, can be exposed to working in and around them.

Confined spaces come in different sizes, in different locations of a facility or job site, and there may be different hazards in each one. There are also many different standards, regulations and company policies that may apply. While complicated, there are some best practices that will help you work safely in and around confined spaces.

Handling confined space entrances and exits, and while working in these areas, should always include:

- A site evaluation
- Identification of proper safety equipment and other required tools
- A trained rescue team that has developed a pre-planning program
- Certified training that involves practice and hands-on experience for all parties who will work in and around a confined space

There are many people involved in planning for and managing confined spaces, accessing and working inside confined spaces, and responsible for any rescue retrieval that may be needed. A confined space supervisor will want to confirm that contractors have had certified training, that all parties understand the hazards and what communication is needed inside the space as well as who will be performing rescue activities. The supervisor may also be the person responsible for controlling the entry (or identifying who will be) and supplying the necessary equipment. If you are responsible for many types of confined spaces it may be helpful for you to walk through each of the major elements, which may be categorized as follows:

- Plan – everything you need before you enter
- Access – what you need to access
- Work inside – communication, communication, communication
- Rescue retrieval – be prepared

Let's break these down a bit more.

Planning for Your Confined Spaces

Every time you enter a permit or non-permit confined space you should complete an assessment. This includes a risk and hazard assessment of the space, an assessment of the people working in and around the space and the level of knowledge they have about confined spaces, as well as an assessment of the personal protective equipment (PPE) you need and the inventory you have available. The degree of supervision that will be needed will be based on these findings. If you don't have a Confined Space Competent Person (if you need training, please contact us) or anyone who strictly manages your confined spaces, you may need a third-party to complete a site assessment to help answer these questions.

What's the difference between a risk assessment and a hazard assessment?

Risk Assessment – This involves identifying and understanding the environment in and around the confined space, including entry location and size of the entry as well as if there are any lockout points and possible sources of energy or chemicals. These things are consistent and very rarely change. This assessment will help you determine if a competent person is needed and if this person needs to remain present for the duration of the work.

Hazard Assessment – This is conducted to assess conditions workers are being exposed to that may present a danger, such as unsafe levels of gas requiring respiratory protection or loud noises requiring hearing protection. The conditions often change and therefore, this assessment should be constantly updated.

What type of training and certification do the workers need?

Workers must have adequate training and experience in the work involved to be competent to function safely in the confined space. Training required must be appropriate to the task, and to the individuals' roles and responsibilities, so that work can be carried out safely. Where the risk assessment indicates that properly training individuals can work for periods without supervisions you should check that they are able to follow the established safe system of work and that they have been provided with adequate information and instruction about the work to be done.

What PPE do you need?

Through the risk assessment and hazard assessment, and working through the hierarchy of controls, you should know what remaining hazards will require PPE protection. 3M has a wide range of PPE equipment that is compatible when working within confined spaces.

Accessing Confined Spaces

Prior to entry, the atmosphere within a confined space should be tested to check the oxygen concentration and to determine the presence of hazardous fumes, gases and vapours as well as respective levels of these potential hazards. Also, if not already addressed, you should also ensure you have the proper equipment for access such as a tripod or a side entry system.

Testing

You should carry out testing when it is known (e.g. from information about its previous content or chemicals used in a previous activity in the space) that the atmosphere in the confined space might be contaminated or to any extent unsafe to breathe. If there is any question about the air quality in these spaces, the area should be tested.

Equipment to access

The various types of confined spaces may all have different access points — side entry, descending from above or crawling up through an entry point — and require different access equipment.

Work Inside Confined Spaces

When working in the confined space, communication and monitoring should be a constant. Environmental elements can change unexpectedly, plus communicating with workers outside the confined space may become difficult.

Communication

An adequate communication system must be in place and should enable communication: (a) between those inside the confined space; (b) between those inside the confined space and those outside; and (c) to summon help in case of an emergency. Whatever system is used — voice, tugs on a rope, telecom devices — all message should be able to be communicated easily, rapidly and clearly between relevant people, especially if they may not be able to see one another.

Monitoring while working

In some cases, there may be a need to limit the time that professionals can work in a confined space, for example where respiratory protection equipment is used, or under extreme conditions of temperature and humidity. This can also be the case when the confined space is so small that movement is severely restricted. For a large space and multiple entries, a log in or tally system may be necessary to check everyone in and out and to control the duration of time they are in the space.

Rescue Retrieval

Death or injury in confined space incidents can and often do occur. Ill-conceived attempts to save others who have collapsed or ceased to respond usually follows from a lack of proactive planning and appropriate training or identification of a proper rescue plan.

Have a rescue plan

A rescue plan should be in place before any person attempts to enter or begins to work in a confined space. Speak up and don't enter a confined space without confirming there is a rescue plan in place outlining how to react should a situation arise where rescue action is needed.

Trained to rescue

Evaluate the needs of a rescue team and what training is required for the team (or individual) to perform a rescue operation, including what additional PPE they may need to help someone out of a dire situation.
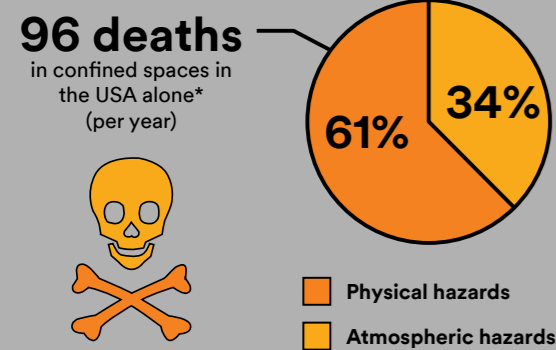
There is a lot to consider when managing and working in and around confined spaces.

Confined Space – Plan and Rescue

Confined spaces present some of the most challenging environments for any health and safety professionals. From potentially toxic atmospheres, to physically hazardous conditions such as extreme temperatures, unstable materials, or the potential for falls, confined spaces often present unseen challenges. Creating and maintaining a safe jobsite with Confined Spaces depends on having correct, current information.
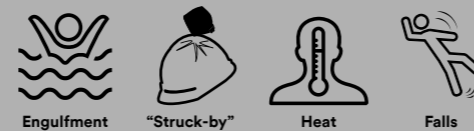
Bad things can happen inside of confined spaces

96 deaths
in confined spaces in the USA alone* (per year)

61% 34%

Physical hazards
Atmospheric hazards

Examples:

Physical hazards

Engulfment   "Struck-by"   Heat   Falls

Atmospheric hazards

CO_2

Oxygen deficiency   Toxic chemicals   Combustible dusts

Source
* http://www.rocorescue.com/roco-rescue-blog/confined-space-fatalities-a-closer-look-at-the-numbers#.WKRkYFUrL3g

3M can help! (Plan, Access, Work Inside, Rescue & Retrieval)

1. Plan
- Training courses
- Regulatory requirements
- Practical tools

2. Access
- Training courses
- Air monitoring
- Retrieval equipment & PPE

Typical environments

- Storage tanks
- Tunnels
- Elevator shaft
- Alkylation unit
- Trench box
- Waste water treatment

- Culverts
- Man hole
- Reaction vessels
- Ductwork
- Utility vault

3. Work Inside
- Training courses
- PPE to help protect from hazards inside the space

4. Rescue & Retrieval
- Training courses
- Tools to help with Rescue plan
- Rescue & retrieval equipment

3M™ Confined Space Training Courses

Enter & Work in Confined Space
● This course is designed for those workers that will work in, or on confined spaces as defined by Australian legislation.

Operate Breathing Apparatus
● This training has been designed to give students the necessary skills to use breathing apparatus to access rescue.

Combined Enter & Work in Confined Space & Breathing Apparatus
● This is aimed at those persons required to access confined spaces which have irrespirable environments.

3M™ DBI-SALA®
5-Piece Hoist System

The most advanced in retrieval system.

Designed for manhole and confined space entry/retrieval applications. The Davit pivots for ease of rescue and has an adjustment for overhead clearance restrictions. The lower base adjusts to fit most standard entries. A range of bases and masts are available.

Features and Benefits:

- 5-piece davit hoist system
- Integrated 5,000 lb. (22 kN) mast anchorage point
- Fall arrest rated in all davit offset mast positions
- Adjustable offset upper davit mast (model 8518001)
- Built-in primary and secondary pulleys
- Adjustable vertical height of 33 in. to 43 in. (83.8 to 109.2 cm)
- Detent and knob style adjustment
- 83.8cm lower davit mast extension (model 8518002)
- Combine up to 2 extensions
- Extends your davit mast height

3M Order Code	Model #	Description
70007932950	8518000	Includes adjustable offset mast, lightweight lower mast and 3-piece lightweight base. **Also available:** multiple size component configurations

3M™ DBI-SALA® Tripods

Note: Tripods come standard with integral pulley system and one quick connect winch/SRL mounting bracket.

3M Order Code	Model #	Description
70007488417	8000000	2.1 m, aluminium, square legs
70007490959	8000010	2.7 m, aluminium, square legs

3M™ DBI-SALA® Emergency Retrieval Sealed-Blok SRL's

Sealed design makes it ideal for working in even the harshest of environments. All Emergency Retrieval Sealed-Blok Self Retracting Lifelines feature an ergonomic integral carrying handle and anchorage karabiner

3400944

3400986

3M Order Code	Model #	Description
70007460069	3400944	15 m stainless steel cable lifeline with stainless steel swivel snap hook and RSQ feature
70007460093	3400955	15 m galvanised cable lifeline with swivel snap hook
70007452025	3400956	15 m stainless steel cable lifeline
70007451720	3400880	25m galvanised with stainless steel swivel snap
70007459830	3400881	25 m galvanised cable lifeline with swivel snap hook
70007460168	3400985	25 m stainless steel cable lifeline with stainless steel swivel snap
70007452157	3400986	40 m galvanised cable lifeline with swivel snap hook

3M™ DBI-SALA® Advanced Digital Winches

Also available: stainless steel cable and Technora rope models

8518560

3M Order Code	Model #	Description
70007496816	8518560	18 m, 5 mm galvanised cable
70007496824	8518561	27 m, 5 mm galvanised cable
70007498184	8518582	58 m, 5 mm galvanised cable

3M™ DBI-SALA® Tripods Accessories

8003205   8003238

3M Order Code	Model #	Description
70007488649	8003205	Snatch block, eye bolt pulley assembly
70007488656	8003238	Leg mount pulley bracket
70007489506	8005048	Mounting Bracket to fit SRL/Winch to Tripod Leg
70007612537	9503094	Tripod carry bag for 8000000
70007612545	9503095	Tripod carry bag

3M™ DBI-SALA® Emergency Retrieval Sealed SRL Accessories

3M Order Code	Model #	Description
70007452256	3401025	Mounting Bracket to fit Sealed Blok Retrieval SRL's to tripod leg

3M™ DBI-SALA® Salalift™ II Winch

Also available: stainless steel cable models

8102001

3M Order Code	Model #	Description
70007489712	8102001	18 m, 6 mm galvanised cable
70007489746	8102009	27 m, 5 mm galvanised cable
70007489720	8102005	36 m, 5 mm galvanised cable

3M™ DBI-SALA® Basic Digital Winches

8518669

3M Order Code	Model #	Description
70007496907	8518669	15 m galvanised cable
70007496915	8518670	15 m galvanised cable

3M™ DBI-SALA® Bosuns Chair/ Spreader Bar

3M Order Code	Model #	Description
70007926135	E522-SB1	Spreader bar with karabiner connections

3M™ DBI-SALA® Side Entry System

Designed for confined space entry/retrieval and rescue operations involving horizontal entries with vertical positioning or retrieval required inside the space. Note: Mechanical devices and attachments sold separately.

3M Order Code	Model #	Description
70007493102	8511233	Side entry system package for use with external adjustment tank collar
70007493094	8516693	Permanently mounted bases External adjustable tank collar

3M™ DBI-SALA® Portable Fall Arrest Posts

For use on top of transformers or other types of platforms with potential fall hazards. A range of mounting bases are available for multiple applications as well as a detachable davit arm for use in rescue.

Note: Mechanical devices and attachments sold separately.

3M Order Code	Model #	Description
70007495354	8516691	Portable Fall Arrest System
70007495370	8516693	Rescue Davit Arm

3M™ DBI-SALA® Bases and Mounting Options

DBI-SALA Advanced portable and Fixed bases work with a variety of davit arm and mast extensions to suit a variety of applications. **Fixed Bases** are ideal for work areas where frequent set-up and tear-down is required and a base can be permanently installed to an existing structure. **Portable Bases** are ideal when you need to move and access various confined space areas. **Also available:** a wide range of other fixed and portable bases in stainless steel and galvanised steel are also available, contact us for more information, or for assistance in determining the most appropriate base for your needs.

8518348

8512831

8510316

8510520

8510323

Fixed Bases

3M Order Code	Model #	Description
70007932778	8518348	Wall Mount Sleeve (Stainless Steel)
70007492906	8510316	Flush Mount Sleeve (Zinc Plated Steel)
70007929709	8512831	Centre Mount Sleeve (Zinc plated Steel)

Portable Bases

3M Order Code	Model #	Description
70007492914	8510323	Barrel Mount Sleeve (Zinc plated steel)
70007493011	8510520	Manhole Collar (Aluminium)

For more information on the complete range of DBI-SALA Confined Space safety systems and options, visit 3M.com.au/FallProtection or contact us.

3M™ DBI-SALA® Delta™ Full-Body Harnesses

The safety harness that won't weigh you down.

Delta™ harnesses combine a set of "industry-first" advancements, with popular features making them the workhorse of the industry. Today's Delta™ represents the culmination of more than twenty years of design, research, manufacturing know-how and on-the-job performance.

Features and Benefits:

REPEL™ Technology Webbing
- Water repellent to reduce attraction of mould and dirt - up to 5 times more abrasion resistance.

Quick-Connect Buckles
- Offers one-handed operation and smooth adjustment.

Easy Grip End Tabs and Keepers
- For fast, efficient and secure web adjustment.

Stand-Up Dorsal D-Ring
- Patented spring-loaded design automatically stands up ensuring fast, easy and safe connections to your fall arrest system.

Impact Indicator
- Rip-stitch indicator allows the user to quickly and easily inspect the harness for impact loading.

Label Pack
- Laminated PVC labels resistant to abrasion, UV, ambient heat, water and a wide range of chemicals. Features permanent indented print of critical product information ensuring it remains visible for the life of the harness.

RFID equipped
- Helps track equipment and manage safety inspection programs.

3M Order Code	Model #	Description
70007926416	803S0018	Small
70007925822	803M0018	Medium
70007925707	803L0018	Large
70007925046	803XL0018	Extra Large

3M™ DBI-SALA® ExoFit NEX™ Confined Space Harness

Ideal for the professional performing confined space access work, ladder access and rescue.

Front, rear and side Tech-Lite™ aluminium D-rings, Duo-Lok™ quick-connect buckles, Revolver™ vertical torso adjusters, non-slip hybrid comfort padding, wide padded lower back/hip pad, suspension trauma straps, confined space retrieval/attachment points, impact indicator, REPEL™ technology webbing.

3M ORDER CODE	Model #	Description
70007929378	623S2018	Small
70007926010	623M2018	Medium
70007925798	623L2018	Large
70007925764	623XL2018	Extra Large

3M™ DBI-SALA® Delta™ BA Rescue/Escape Harness

Ideal for use with rescue/escape breathing apparatus equipment.

Large rear fall arrest rated D-ring, front fall arrest rated D-ring, confined space/retrieval attachment points, quick-connect buckles, stainless steel hardware, air line attachment straps, rear BA pigtail connection strap, fully adjustable, REPEL™ technology webbing.

Note: Hip mounted escape cylinder bag to be supplied by customer for attachment to harness

For illustrative purposes only.
Breathing Apparatus not included.

3M Order Code	Model #	Description
70008288378	823S1050	Small
70007964128	823M1050	Medium
70008288360	823L1050	Large
70008288394	823XL1050	Extra Large

Scott Safety ProPak-i T2 SCBA

The Scott Safety ProPak-i is a Type 2 SCBA set ideal for professional fire fighting, suitable for marine, petrochemical, oil and gas, general industrial environments, short duration confined space entry work and rescue applications. It can be offered with a range of air supplied options (SDC, Y2C, AC). The AC, airline attachment has both air in and air out functionality so therefore serves as a Rescue Second Man (RSM) and decontamination attachment as well as airline.

- Rigid backframe construction
- Easily removable pneumatics
- Cost effective to service and maintain
- Kevlar blend wrap around harness
- Side arms for increased user comfort
- Certified to AS/NZS 1716:2012 and EN137:2006 Type 2 MED

3M Order Code	Model #	Description
XP100142049	2027166	SCBA ProPak-I T2 V2 Industrial
AT010663915	2027167	SCBA ProPak-I-AC V2 Industrial
XP100544202	013190	Promask PP Left Quick Fit (LQF) Full Face Mask
XP100071271	1071671	Vision 3 (LQF) Full Face Mask Vision 3
AT010700105	1118245T	Cylinder 6.8L 300 Bar Carbon Fibre Right Angle Valve
AT010660218	1127413RAV	Cylinder 9L 300 Bar Carbon Fibre Right angle Valve

ELSA Rapid Escape from Hazardous Environments

The Scott Safety ELSA (Emergency Life Support Apparatus) is designed for rapid escape from hazardous industrial and marine environments. Reliable and simple to operate the ELSA is trusted by thousands of users across the world.

- Automatic activation – a constant flow of air is provided upon opening the ELSA bag
- Integrated warning whistle for depleted air
- Easily rechargeable and reusable
- Unique cuboid hood with elastomeric neck seal for easy donning and excellent visibility
- Hood design enables it to be worn by those with beards or glasses
- Cylinders provided charged/full
- Marine Equipment Directive (MED Shipswheel) approved
- Certified to AS/NZS 1716:2012

3M Order Code	Model #	Description
AT010699992	2009419	ELSA 15 minute escape set with cylinder

FLITE Positive pressure airline/escape breathing apparatus

The Scott Safety Flite is a first breath activated positive pressure airline breathing apparatus with the option of hip mounted 10 minute compressed air cylinder supply for escape from the most hazardous environments. Ideal for extended working, restricted access areas, working in confined spaces, with the reassurance of an emergency supply of air.

- Simple operation
- Adjustable and padded webbing bandolier harness for comfort and safety
- Used with Scott Safety Promask PP or Vision 3 full face masks
- Optional hip mounted escape cylinders
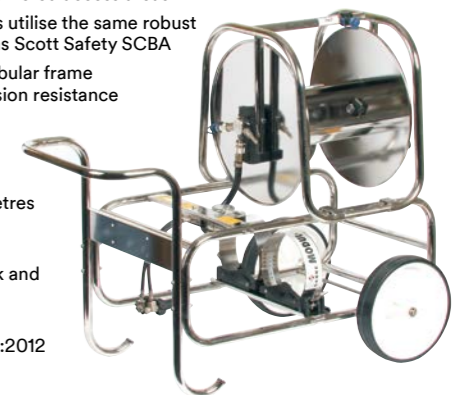- Mask and cylinders purchased separately
- Certified to AS/NZS 1716:2012

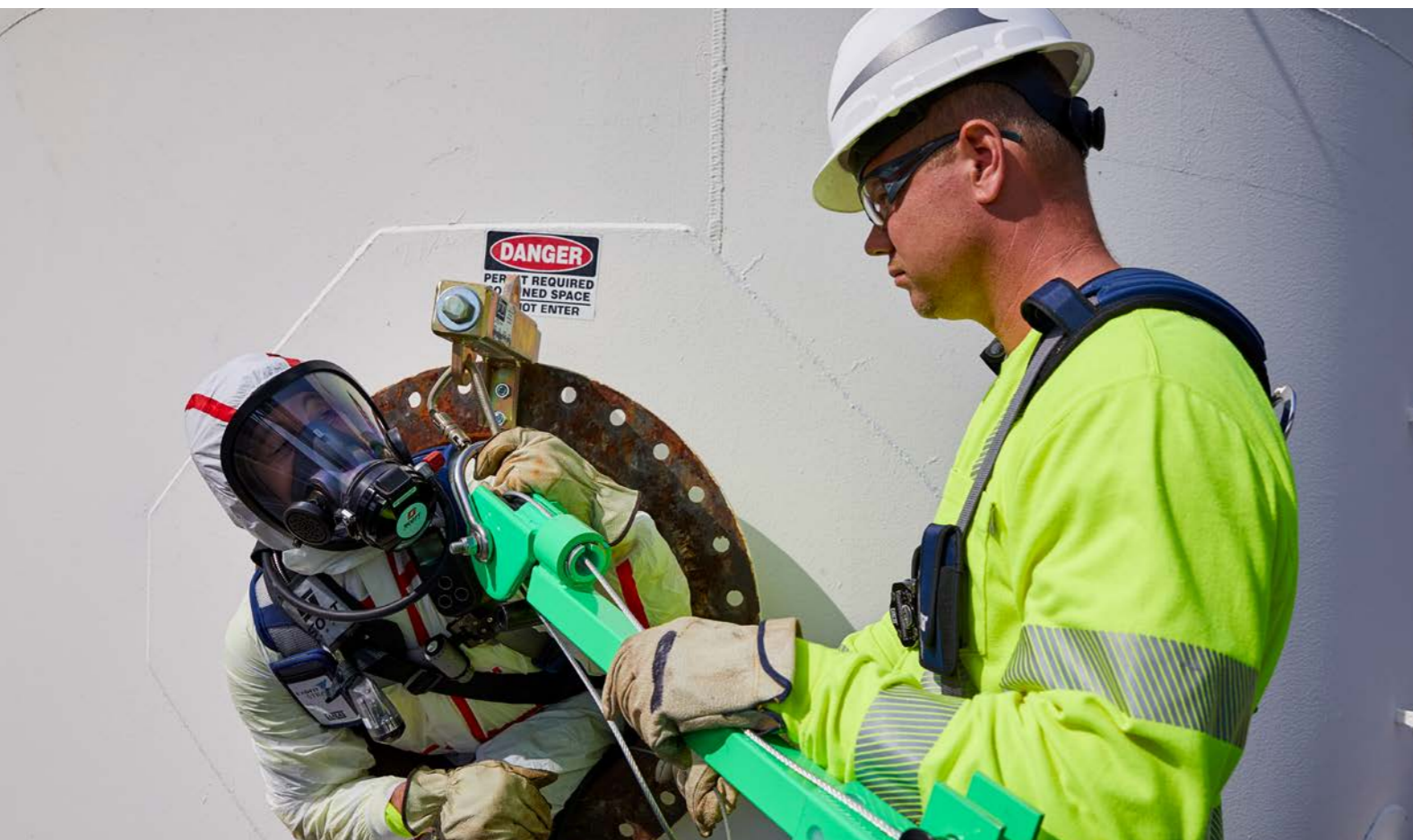| 3M Order Code	Model #	Description
XP100069002	1047792	Flite Airline Breath Apparatus
XP100544202	013190	Promask PP Left Quick Fit (LQF) Full Face Mask
XP100071271	1071671	Vision 3 (LQF) Full Face Mask Vision 3
AT010699976	2006648	Flite Cylinder 2L 200 Bar Steel Cylinder 10 min escape

Modulair Portable Air in Restricted Access Areas

The Scott Safety Modulair Airline Trolley System provides a portable compressed air supply system for users of airline breathing apparatus. The Modulair is available in 2 and 4 cylinder versions, 2 and 4 wearer versions and with optional extras such as airline filter units and electronic low pressure alarms.

- Ideal when working in restricted access areas
- Pressure reducer systems utilise the same robust and proven technology as Scott Safety SCBA
- Welded stainless steel tubular frame for robustness and corrosion resistance
- Compact and portable
- High performance pneumatics
- Hose reel will hold 90 metres of PVC or 60 metres of anti-static hose
- Hose, cylinder, face mask and breathing apparatus sets purchased separately
- Certified to AS/NZS 1716:2012

3M Order Code	Model #	Description
XP100069671	1051844	Modulair Trolley with hose reel - 2 cylinder, 2 man (no hose)
XP100069812	1051880	Modulair Trolley with hose reel - 4 cylinder, 4 man (no hose)
AT010700113	1118245T	Cylinder 6.8L 300 Bar Carbon Fibre T valve
AT010700121	1127413T	Cylinder 9L 300 Bar Carbon Fibre T valve
XP100069143	1051467	20 metre PVC hose black with CEN couplings

PS200 Series
Portable Gas Monitor

Features and Benefits:

- Ideal for protection in confined space applications
- Simple 1-button operation
- Measures up to 4 gases simultaneously - oxygen, carbon monoxide, hydrogen sulphide and flammable gases - in any combination.
- Audible, visual and vibrating alarms
- Optional internal pump
- Lightweight yet robust construction
- Rechargeable Li-Ion battery
- Sensor integrity checking
- Ease of maintenance

3M Order Code	Model #	Description
XP100258274	64041	PS200 Portable Gas Monitor, LEL, O_2, CO/H_2S Sensors
XP100258969	64141	PS200 Portable Gas Monitor, LEL, O_2, CO/H_2S Sensors. c/w Pump and Tubing
AT010661323	64141KIT	Confined Space Kit c/w 64141, 34 litre calibration gas, regulator, probe and foam lined carry case

3M™ UniSafe™ TA570 UniLite Vented Safety Helmet

- Type 1 ABS plastic vented safety helmet with crown cooling vents that is ideal for general industrial, construction and mining
- Comfortable, versatile and lightweight, with vents allowing improved air circulation
- All 3M UniSafe safety caps have an accessory slot for fitting accessories such as earmuffs and faceshields
- A six point terylene harness and a terry towelling sweatband give added comfort and a gutter diverts rain away from the wearer

3M Order Code	Description
TA570:WH	UniLite Safety Helmet vented - White
TA570:YE	UniLite Safety Helmet vented- Yellow
TA570:BL	UniLite Safety Helmet vented- Blue
TA570:FLOR	UniLite Safety Helmet vented- Fluoro Orange
TA570:FLYE	UniLite Safety Helmet vented- Fluoro Yellow
TA570:GN	UniLite Safety Helmet vented- Green
TA570:OR	UniLite Safety Helmet vented- Orange
TA570:RD	UniLite Safety Helmet vented- Red
TA570:WA	UniLite Safety Helmet vented - Watermelon
TA570:GY	UniLite Safety Helmet vented - Grey

3M™ Protective Coverall 4515 White

The 3M Protective Coverall 4515 helps protect against light liquid splashes and hazardous dusts. Typical applications for this safety work wear may include: insulation installation, asbestos and lead abatement, coal dust in power plants, metal polishing, general powder handling, general industrial clean-up and processing, and granular fertilizer application.

- Breathable material technology for reduced heat stress and breathable comfort all day
- Excellent barrier against dry particles and limited liquid splash (CE Type 5/6)
- Elastic waist, ankles, and wrists for convenience and freedom of movement
- Meets inward leakage requirements of EN 1073-2 for protection against nuclear particles
- Does not contain components made from natural rubber latex to help prevent reactions from users with latex sensitivities or restrictions

3M Order Code	Description
GT700004127	Medium
AT010588898	Large
AT010588906	XL
AT010588914	XXL
GT700004168	3XL
GT700004333	Orange - Medium
GT700004341	Orange - Large
GT700004358	Orange - XL
GT700004366	Orange - XXL
GT700004374	Orange - 3XL

3M™ PELTOR™ LiteCom™ Pro II Headband Headset

3M™ PELTOR™ LiteCom Pro II Headsets are a hearing protector with built-in programmable two-way communication radio, level dependent functionality and an external audio input. It is approved for use in potentially explosive atmospheres according to ATEX/IECEx regulations.

- Headset-to-headset communication with ability to be integrated with similar professional radio communication systems
- Up to 30 programmable radio channels in the 450–520 MHz frequency.
- Noise attenuation helps provide hearing protection in environments with potentially hazardous noise
- Noise cancelling speech microphone to help provide clear communication in noisy environments
- Level dependant microphone helps improve situational awareness and communication
- Easily adjustable Voice Operated Transmission (VOX) for increased functionality in high noise environments
- External connection jack provide the possibility to connect to an external PTT adaptor

3M Order Code	Model #	Description
UU004229702	MT7H7F5010-AZ-50	Cap Attached Earmuff

3M™ Versaflo™ Spray Painters' Kit

The 3M™ Versaflo™ Spray Painters Kit, ALVM-106E is a ready-to-use assembly that delivers integrated supplied air respiratory, eye and face with optional hearing protection. The kit includes Versaflo Supplied Air Regulator, V-500E with accessories and Versaflo High Impact Faceshield M-106 with comfort faceseal.

- Versaflo Supplied Air Respirator Kit, V-500E with Standard Breathing tube and Standard Waist Belt
- Versaflo High Impact Faceshield M-106 delivers integrated eye, face and respiratory protection with optional hearing protection
- Excellent airflow distribution for improved comfort, lower noise and reduced fogging.

3M Order Code	Model #	Description
AT010587783	ALVM-106E	Versaflo™ Spray Painter Kit