



OPERATIONS & EMERGENCY RESPONSE BA SOLUTIONS



**Quest
SCBA**

**AIR-walker
FAST-cape**

**RIG-walker
FAST-cowl**

**EEBA
FAST-mask**



Positive Pressure Facemask Technology

EMERGENCY ESCAPE BREATHING APPARATUS (EEBA)

The FAST-mask, FAST-cowl are activated when the mask is deployed from their stowage bag. As the lanyard clip is removed, the cylinder valve assembly opens the medium pressure air supply. The head harness is automatically inflated while at the same time purging the facemask of any traces of hazardous gas, before rapid donning in less than five seconds. Placing the facemask onto the face immediately creates a face seal, which in turn automatically deflates the self-tensioning head harness and switches the demand valve regulator to positive pressure breathing.

SUPPLIED AIRLINE BREATHING APPARATUS

The Quest SCBA, AIR-walker and RIG-walker facemask options are activated when the demand valve regulator switch, with safety lock system is rotated to open the medium pressure air supply, which automatically inflates the head harness prior to rapid donning in less than five seconds, with automatic mask tensioning achieving a face seal and activation to positive pressure breathing.

FAST-cowl FACEMASK TECHNOLOGY

The FAST-cowl facemask system provides wearers with much higher protection factor performance than the FAST-mask, including wearers with facial hair/beards. This claim is supported by third party test reports available to download on the Cam Lock website.

ONE-SIZE-FITS-ALL FACE SEAL

The FAST-mask and FAST-cowl facemasks are certified and approved with a one-size-fits-all face seal, reference the Bivariate Panel of test subjects face sizes recorded in the HSE laboratory TIL test report number, BSi 3098045.

COMPLIANT WITH INTERNATIONAL RPE STANDARDS AND APPROVALS

CE, UKCA, MED, MER, AS/NZ, and NIOSH



HEAD HARNESS OPTIONS



Standard head harness with orange tracer for head circumferences less than the 95th percentile



Extra Large (XL) head harness with green tracer for head circumferences above the 95th percentile $\geq 600\text{mm}$

Reference: ISO/TS 16976-2:2015 Respiratory Protective Devices – Human Factors – Part 2: Anthropometrics



Emergency Escape Breathing Apparatus (EEBA)



Protecting personnel with facial hair

FAST-cowl facemask protection to all wearers; including those with facial hair.

Cam Lock have commissioned third party organisations to conduct test programmes to the ISO 16900-1:2019 facemask Total Inward Leakage (TIL) test protocols. The BSI – HSE Buxton Science and Research Centre Laboratories and the ProQares (TNO) Simulated Workplace Protection Factor (SWPF) studies on subjects with facial hair/beards.



Time to Protect personnel from the sound of the emergency gas release alarm.

EEBA selection from a Quantitative Risk Assessment (QRA) viewpoint, highlights the importance of both the 'Speed of Donning' and the Assigned Protection Factor (APF) clearly differentiating positive pressure

facemask systems compared to simple constant flow hood EEBA.

Cam Lock's automatic tensioning quick donning head harness, in less than five seconds, sets the benchmark for rapid protection in the event of an emergency gas release.



Scan QR code for FAST-cowl donning video



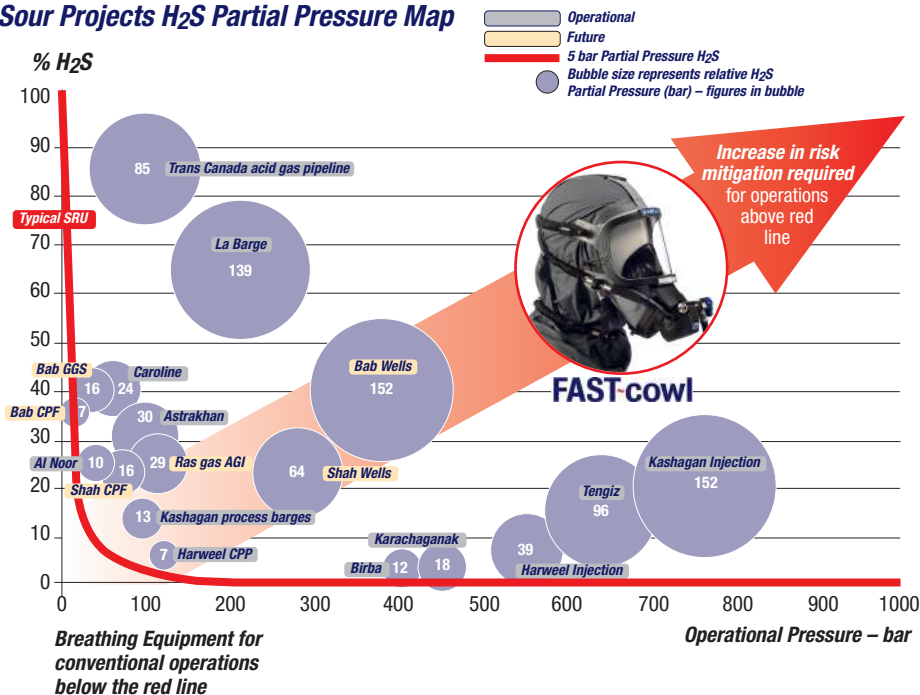
PRODUCT RANGE

Cam Lock's 'critical life safety' industrial breathing apparatus product technology has developed a proven history of reliable operational performance with major international corporations in the Oil and Gas industry since 2009.

The key Cam Lock RPE characteristics and difference from conventional RPE are:

- Quicker facemask donning time (less than 10 seconds) and completely operator error free i.e. simple training
- Higher toxic protection performance – reference the H₂S partial pressure map below
- Protection of *all* personnel including those with facial hair/beards

Sour Projects H₂S Partial Pressure Map



End Users protecting their personnel with Facial Hair

PDO SHELL

Al Noor, Harweel, Marmul, Nimr, Rabab Harweel, Yibal Khuff – Oman and their fire intervention teams (FIT)

QSGTL SHELL

Ras Laffan – Qatar and their fire intervention teams (FIT)

ADNOC GAS and ADNOC OFFSHORE

Abu Dhabi – UAE

EXXONMOBIL

de Gravenchon – France and their sapeurs-pompiers (firefighters)

EXXONMOBIL

Fos-Sur-Mer – France and their sapeurs-pompiers (firefighters)

BP MUKHAIZNA

Oman

OCCIDENTAL MUKHAIZNA

Oman

SHELL PERNIS

Rotterdam – Netherlands

SHELL MOERDIJK

Rotterdam – Netherlands

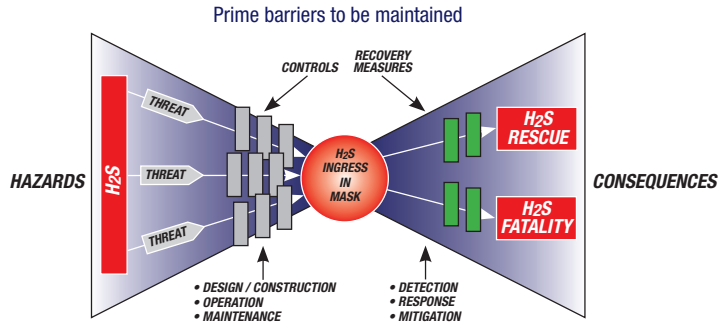
FORMOSA PETROCHEMICAL

Taiwan



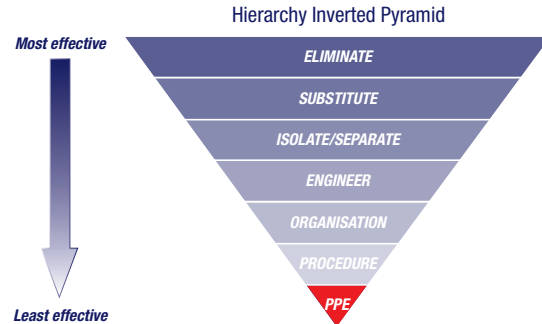
RPE (SCBA/EEBA) – Another Safety Critical Element

The key tool that enables consideration and review of potential hazards and consequence analysis is the 'Bowtie', that initially looks at preventative barriers to reduce the likelihood of a toxic hazard release and additional barriers that are in place to reduce or recover from the undesirable effects of the hazard. In this case, primarily to prevent fatalities.



Cam Lock's unique quick donning and high protection factor facemasks, including personnel protection with facial hair, enhances the Bowtie prevention and recovery controls in comparison with conventional RPE.

This ensures both prevention barriers as well as recovery controls exist.



RPE TECHNOLOGY – A Key Safety Critical Element to Support Risk Reduction

The hierarchy inverted pyramid, risk mitigation of the seven elements initially focus on the top three elements:

- 1) **Elimination of the hazard**
- 2) **Substitution of the hazard**
- 3) **Isolation or separation of the hazard**

The next three elements:

- 1) **Engineering controls** – safety and preventative
- 2) **Organisational controls** – training, competency and communication
- 3) **Procedural controls** – operating procedures, work instructions and permits

Traditionally the 'last line of defence' in this risk reduction hierarchy is Personal Protective Equipment (**PPE**). Typically H₂S Breathing Apparatus (BA), does nothing to prevent the hazard or mitigate the hazard. All BA equipment can do is protect personnel in the event of an emergency gas release.

However, the Cam Lock FAST-cowl facemask system minimises the 'Time to Protect' personnel with its rapid facemask donning in less than 10 seconds in combination with High Protection factors, is affording considerable risk reduction capability, in the As Low As Reasonably Possible (ALARP) statement – as a fully rated and tested safety critical element (see also Bowtie graphic). Cam Lock's RPE also supports the Organizational and Procedural Risk Reduction Controls.



Cam Lock Future Development Plans – Next Generation RPE

The route map for development and improvement of our BA equipment will include several important technical upgrades.

- 1) **Integrity** – design improvements to the BA product assemblies.
- 2) **Ergonomics** – including weight reduction, comfort, integration with other safety equipment.
- 3) **Technology** – primary aim to mitigate risk further in the hierarchy inverted pyramid in the organisation controls section with the incorporation of robust face mask communications and additional technology developments in adjacent markets e.g. CBRN.
- 4) **Next Generation** – Although already fully compliant with all RPE International Standards (ISO, EN, BSI, ASNZ, NIOSH and MED), Cam Lock, as part of their ongoing Technology Innovation Program and taking the extensive global operating experience into account, intend to enhance the current RPE product range to include features of, but not limited to:
 - Mask externally mounted radio communications system and voice amplifier.
 - Mask mounted filter canister options.
 - Mask integrated hydration option.
 - SCBA options including Rescue Second Mask (RSM) QuickFill (QF) cylinder refilling and rapid breathing air cylinder change with quick release cylinder valve connection and over centre cylinder strap quick release locking latch.

Cam Lock Vision and Mission Statement

VISION Preferred supplier of best in class personal protection technology for all toxic environments.

MISSION Provision of best performing and most user friendly RPE to protect all personnel, including those with facial hair, using latest innovative design.



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