The Safety Company

MSA's Firehawk™ M7 Air Mask Cost of Ownership Position Paper

Due to the importance of understanding the cost of ownership in the selection of SCBA, MSA has developed this detailed explanation of the cost of ownership for an MSA Air Mask.

Although some manufacturers of SCBA advise their customers that service is not required unless the SCBA malfunctions, MSA believes **preventative maintenance** should be performed on all critical life-saving equipment. Because user safety is paramount, preventative maintenance is the basis for the MSA service policy.

The purpose of conducting preventative maintenance on an SCBA is to replace the pneumatic seals and other **critical elastomeric components** that are **not visible for daily inspection**. Although MSA has no reported instances of seal failure with the Firehawk Air Mask, the consequences of such an occurrence with any brand of SCBA could be catastrophic. The importance of seal integrity has been further highlighted with the recent advent of CBRN respiratory protection. **Chemical warfare agents** are known to be highly aggressive and penetrating to elastomeric materials and carry extremely lethal effects when introduced through the respiratory tract.

Seals and other elastomeric materials used in the regulators of SCBA are common to all brands regardless of the manufacturer. Therefore, **MSA seals** are **no more susceptible** to damage than any other brand. Here are a few of the facts about seals that users should know:

Facts about Pneumatic Seals:

- The failure of a seal could result in the SCBA failing to function properly or the rapid loss of air during firefighting.
- Pneumatic seals typically **wear faster** than other types of seals, such as hydraulic seals, because air dries the seals over time, causing them to loose their lubricity.
- The life of a seal is dependent on many external factors such as thermal and chemical exposure, which are often unknown to the firefighter.
- Seals, like most materials, commonly fail while under **a high stress dynamic load**, which is exactly the type of load most seals are subjected to during firefighting.
- A room temperature flow test **is not** an accurate means of determining the condition of a seal. An SCBA can pass a flow test and experience a seal failure during the next use. Firefighting conditions are more demanding than the controlled environment of a flow test.
- O-ring manufacturers offer the latest compounds to all SCBA manufacturers, giving no single manufacturer a material or design advantage.
- Chemical warfare agents (CBRN) are highly penetrating to elastomeric materials, with **MMR diaphragms** being among **the most vulnerable**. This is because diaphragms are made of a very thin and soft rubber with a large surface area. The only responsible position for any manufacturer is to inform users of how to maintain this critical component.

Service Frequency:

MSA understands that fire departments vary greatly in their use of SCBA. Because pneumatic seals last longer when used less, MSA has developed three categories of use to minimize the frequency of replacement for many users. Here are the three categories of use and corresponding overhaul frequency.

Category	Average Cylinder Usage	Pneumatic Seal Replacement	CBRN Shield Replacement	NFPA Flow Test
Category I	One 30' cylinder per day or greater	Once Every 3 Years	Every year	Every year
Category II	One 30' cylinder every other day	Once Every 8 Years	Every 3 years	Every year
Category III	One 30' cylinder per week or less	Once Every 15 Years	Every 10 years	Every year

Cost of Ownership Summary:

The total cost of ownership over fifteen years is summarized in the following table according to frequency of use of the Air Mask. In addition to the cost of replacement seals and CBRN shield, an allowance should be included for an annual flow test as recommended by the NFPA 1852 Standard on the selection, care and maintenance of SCBA, which MSA supports.

Total Cost of Ownership over 15 years for an MSA Firehawk M7 Air Mask							
Category	Seal Replacement Kits			CBRN Shield Replacement			Annual Cost of Ownership for a CBRN Firehawk Air Mask
	#	Cost	Total	#	Cost	Total	
Category I	4	$70.67	$282.68	14	$22.95	$321.30	$40.27
Category II	1	$70.67	$70.67	4	$22.95	$91.80	$10.33
Category III	0	$70.67	$0.00	1	$22.95	$22.95	$1.53

In summary, even at a reasonably high frequency of use of one cylinder every other day, the cost of ownership of an MSA Firehawk Air Mask is **less than $10.33 per year**. This is a small price to help ensure the reliability of equipment that a firefighter's life depends upon with each and every use.

Although some manufacturers may choose to boast a maintenance free policy, and in effect "bet the odds" with firefighter safety; the need for preventative maintenance of all SCBA is unquestionable to MSA. This belief extends beyond the issue of cost of ownership and instead reflects an ethics policy consistent throughout all aspects of MSA.

Firefighters can be assured that from the initial manufacture of the Air Mask to warranties and post-sales support, they will be protected by a company, nearly 100 years old, built on the unwavering value of safety.

Sincerely,

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Product Line Manager, SCBA

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