FIRE FIGHTING AND EMERGENCY RESPONSE

PERSONAL PROTECTIVE EQUIPMENT: PROPER USAGE, SERVICE AND MAINTENANCE

prepared by: Rotronics Systems Inc.

FIRE FIGHTING PPE SPEAKER

Ryan J. Marino

- Bachelor of Science in Business Administration
- BOSH for Safety Officer 1 (SO1) – 2020 Certified
- MSA SCBA Certified Technician
- 5 years in Fire Fighting Industry

ROTRONICS SYSTEMS INC.

SCBA – PARTS AND USAGE

SCBA

Shoulder pads
Lumbar pad
-Nomex
Chest Straps
-Kevlar Harness

Remote Pressure Gauge

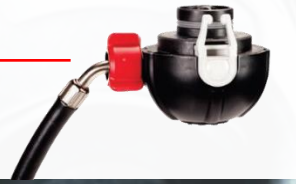
Ultra Elite Facepiece
94% unimpeded vision
STC connector
Nose cup
Exhalation Valve
Speaking Diaphragm

Carbon Fiber Cylinder – 7 lbs
30 minutes = 2216 psig = 1200 L of air
Rescue Test – 40 lpm

Cylinder gauge
Cylinder valve

Audi-Larm EOSTI –
25% service life ≈ 550 psig ≈ 7 mins

PR14™ First-Stage Regulator
14 replaceable part w/o special tools
2216 psig → 80 psi



Second Stage Regulator (MMR)
-pressure-demand regulator
-keeps positive pressure in the facepiece all the time

BRAND

MSA Airhawk II

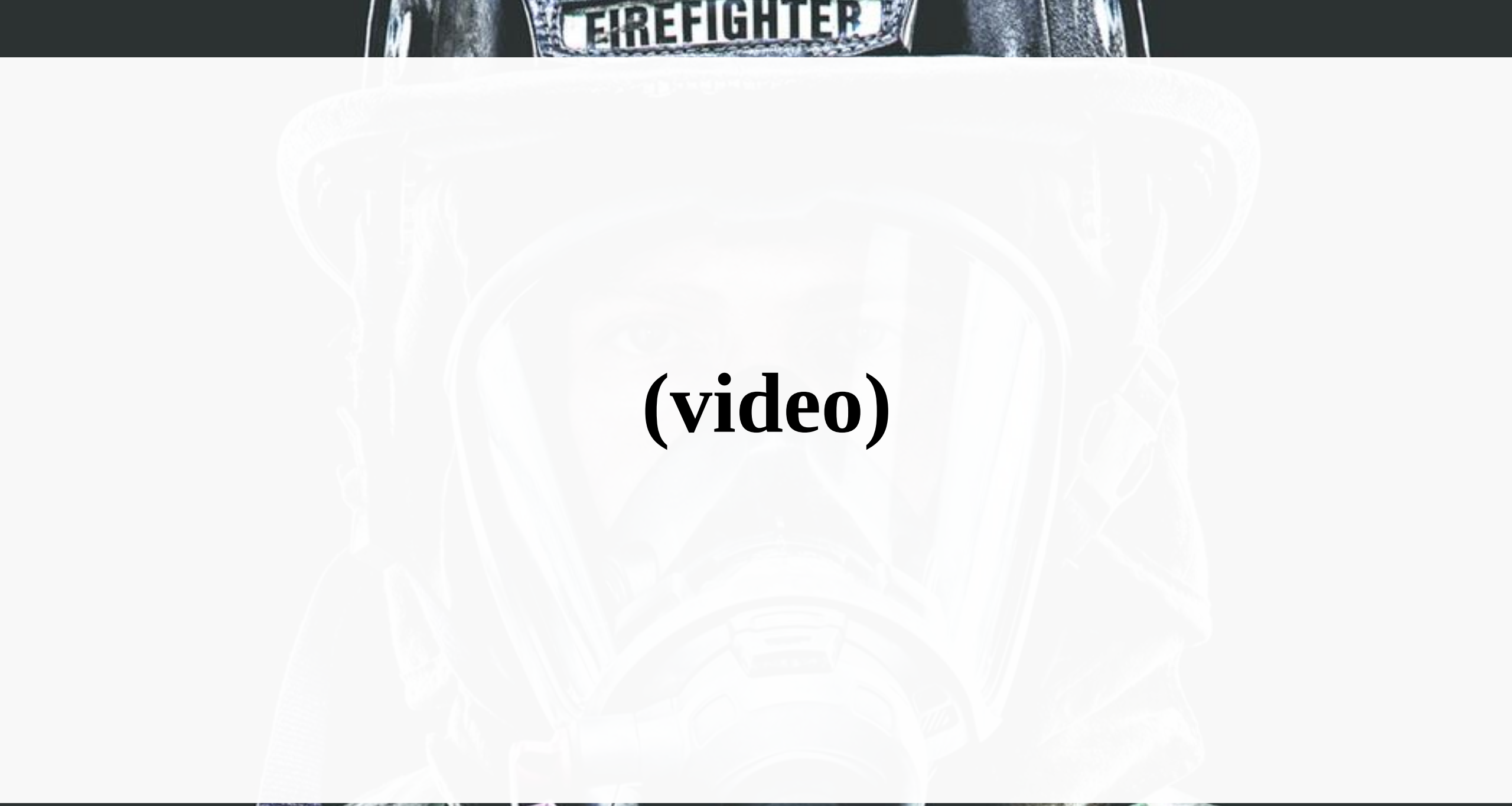
APPROVAL

NIOSH

LIFESPAN

Carbon Cylinder – 20 years

HOW TO USE SCBA



(video)

INSPECTION

1. Check that the cylinder is fully pressurized.
   Gauge is PSI x 100 increment;
   2216 psig ≈ 22 x 100 – **yellow part**.
   Do not use cylinder if not fully pressurized.
2. Red bypass knob is **fully** closed (clockwise).
3. Open valve fully, listen for the alarm to sound briefly.
   Do not use apparatus if the alarm fails to sound.
4. To check for airflow, open and close the red bypass knob **briefly**.

DONNING

1. Don the scba.
2. Adjust straps.
3. Neckstrap → Don the face piece – **chin first**.
4. Pull harness over head. Adjust **straight back**, not out.
5. Facepiece Fit – hold palm over inlet connection → inhale and hold breath for 10 seconds

Do not wear eyeglasses under the facepiece. The temples or side bars will prevent an airtight seal

6. Open the cylinder valve. Connect MMR to facepiece by pushing inward. Ensure regulator **locks** into place.

Do not connect MMR to facepiece without opening cylinder valve as there will be no source of air but the cylinder.

7. Inhale **sharply** to start air supply.





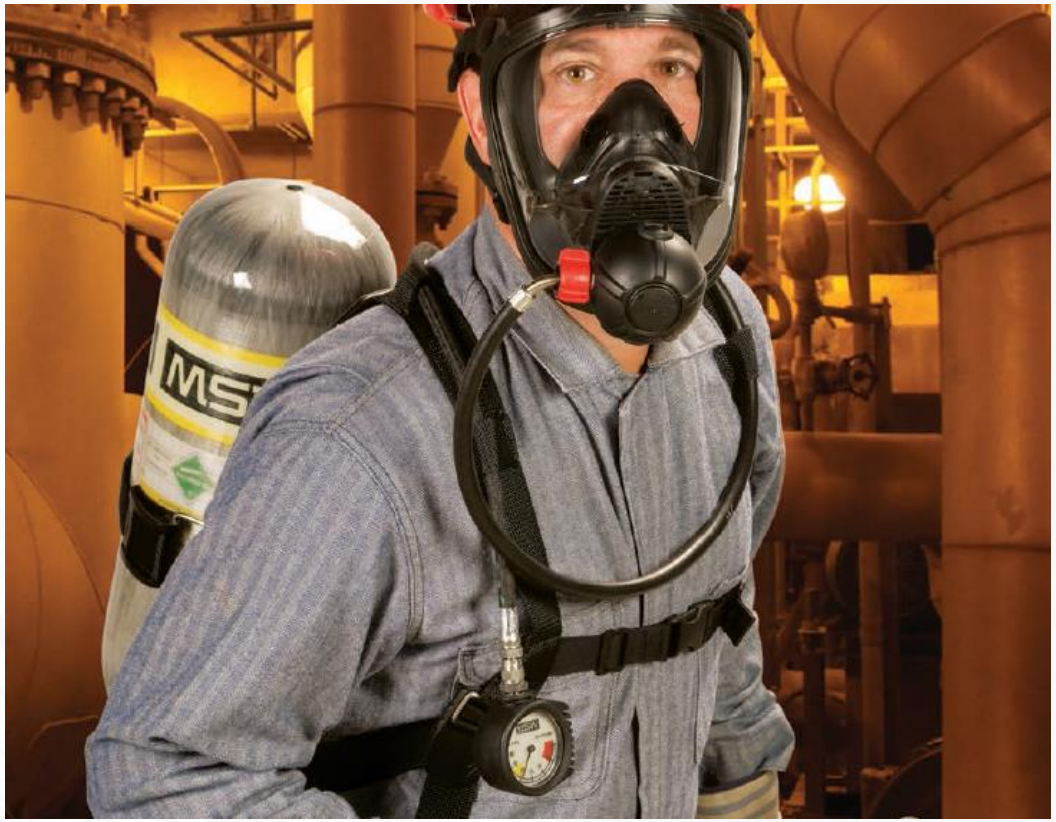

PRECAUTIONS DURING USE

Yellow Indicator ≈ 30 minutes ≈ full cylinder
Red Indicator ≈ 7 mins – continuous Alarm

Two uses of bypass:

- Continuous flow of air in case of emergency.
- Release pressure after use.

There must be a continuous flow of air when the bypass knob is opened. **If not, do not use the apparatus.**



Note: Air mask service life is reduced greatly when the bypass is used.

- Reduced air flow: **Immediately** open the bypass.
  Immediately return to fresh air.
- Air mask free-flows: **Immediately** return to fresh air.
- Audible alarm sounds: **Immediately** return to fresh air.

DOFFING

1. Push the release buttons and pull the regulator **down and out** of the facepiece.
2. Close cylinder valve fully.
3. Open bypass to **release system pressure and then close it after.**

Do not forget to release the system pressure before storing the SCBA. This is one of the main causes of leak and damage.

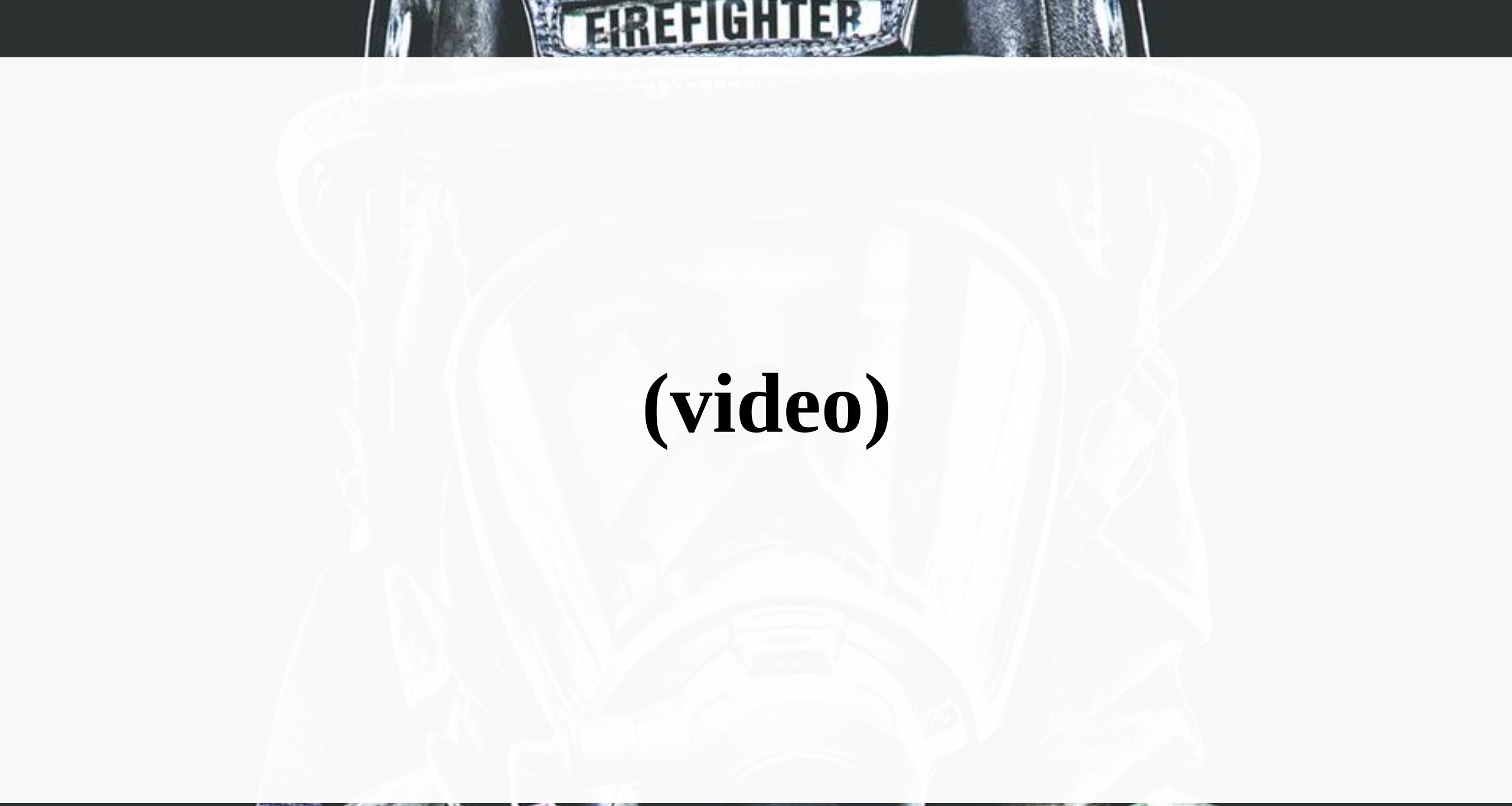
4. Stow regulator in stand-by belt mount.
5. Remove facepiece by loosening the harness straps.
6. Disconnect belt and chest buckle.

Loosen all straps before storing, thereby making next user able to respond faster on emergency.





HOW TO CLEAN AND DISINFECT SCBA FACEPIECE



(video)

SCBA - CLEANING

- **Alcohol should not be used as a germicide because it may deteriorate rubber parts.**
- **If not rinsed thoroughly, cleaning agent residue may irritate the wearer's skin.**

1. Preparing Solution

    a. Follow the instructions with the Confidence Plus Cleaning Solution.

    b. If the Confidence Plus Cleaning Solution is not used, wash in a **mild cleaning solution**, rinse thoroughly, and submerge in a **germicide solution** for the manufacturer's recommended time.

2. Clean and Disinfect the Facepiece

    a. Thoroughly wash and use soft brush or sponge to clean the soiled facepiece. Wash with clean warm water.

    b. Allow to air dry. Do not place in direct sunlight. The rubber will deteriorate.

3. Air Frame and Harness

    a. Use sponge or soft bristle brush to remove surface dirt.

SCBA – CLEANING ALTERNATIVES

MSA recommends using a simple dish detergent that can be purchased commercially such as Dawn® dishwashing liquid as a mild cleaning solution. Per the recommendation in the manual, this cleaning solution should be rinsed thoroughly before completing the next step of the cleaning/disinfection process.

Center for Biocide Chemistries

American Chemistry Council

Novel Coronavirus (COVID-19)—Fighting Products[i]

UPDATED 2/19/2021

The American Chemistry Council's (ACC) Center for Biocide Chemistries (CBC) has compiled a list of products that have been approved by the U.S. Environmental Protection Agency (EPA) for use against emerging enveloped viral pathogens and can be used during the current novel coronavirus (COVID-19) outbreak. This product list is not exhaustive but can be used by business owners, health professionals, and the public to identify products suitable for use during the COVID-19 situation.

The information in this document is being provided as a public service. All efforts have been made to ensure the information is accurate, but ACC and CBC make no representations or warranties as to the completeness or accuracy of the information. ACC, CBC, and the product manufacturers listed in this document reserve the right to change, delete, or otherwise modify the information without any prior notice. Persons receiving this information must make their own determination as to a product's suitability prior to use based on the product labeling. ACC and CBC do not guarantee or warrant the standard of any product referenced or imply approval of the product to the exclusion of others that may be available. All products listed are registered for labeled uses in accordance with federal laws and regulations as of the date this document is being made available. State regulations may vary. In no event will ACC or CBC be responsible for damages of any nature whatsoever resulting from the use of or reliance upon products to which the information refers.

For more information about the COVID-19 Product list, please check out the following COVID-19 FAQ and the Center for Biocide Chemistries FAQ. Additional information about how good chemistry is helping in the fight against COVID-19 can also be found at *Good Chemistry Lives Here.*

Note: The CBC cannot make a determination of the effectiveness of a product in fighting pathogens like COVID-19. For questions related to the effectiveness of any product not listed below, please contact the manufacturer directly.

For use of the product, please contact the company/distributor to confirm use directions, or consult the EPA approved label at https://www.epa.gov/pesticide-labels/pesticide-product-label-system-ppls-more-information.

Commercially Available Product Name	Company/Distributor	EPA REG No.	Formulat Type
Bright Solutions HP2O2	Bright Solutions	45745-11-75473	Dilutable
Clorox Commercial Solutions Pine-Sol Multi-Surface Cleaner	The Clorox Company	5813-101-67619	Dilutable
CloroxPro™ Clorox® Germicidal Bleach	Clorox Professional Products Company	67619-32	Dilutable
Facility +	Midlab	45745-11	Dilutable
Lysol® Laundry Sanitizer (Pre-soak Only)	RB	777-128	Dilutable
Original Pine-Sol Multi-Surface Cleaner	The Clorox Company	5813-101	Dilutable
Peroxide Disinfectant Cleaner Victoria Bay	Victoria Bay Products	45745-11-61868	Dilutable
SD Disinfecting Cleaner	Native Green	6836-77-85898	Dilutable
Capricorn II	Church & Dwight Co., Inc.	10772-25	Dilutable
Clorox Healthcare® Fuzion® Cleaner Disinfectant	Clorox Professional Products Company	67619-30	RTU
LYSOL® DISINEFCTANT MAX COVER MIST	RB	777-127	RTU
LYSOL® DISINFECTANT SPRAY	RB	777-99	RTU
PROFESSIONAL LYSOL® DISINFECTANT SPRAY			
RTP Ready to Perform Disinfecting Cleaner	PDQ Manufacturing, Inc.	6836-152-58880	RTU
Wet & Forget Indoor Mold+Mildew Disinfectant Cleaner	Wet & Forget USA	6836-152-85342	RTU
Clorox Commercial Solutions® Clorox® Disinfecting Wipes	Clorox Professional Products Company	67619-31	Wipe
Clorox Commerical Solutions® Hydrogen Peroxide Cleaner Disinfectant Wipes	Clorox Professional Products Company	67619-25	Wipe
Clorox Disinfecting Wet Mopping Cloths	The Clorox Company	5813-113	Wipe
Clorox Disinfecting Wipes	The Clorox Company	5813-79	Wipe
Clorox Healthcare® Bleach Germicidal Wipes	Clorox Professional Products Company	67619-12	Wipe
Clorox Healthcare® Hydrogen Peroxide Cleaner Disinfectant Wipes	Clorox Professional Products Company	67619-25	Wipe
Dispatch Hospital Cleaner Disinfectant Wipes	Clorox Healthcare	56392-8	Wipe
Lysol® Disinfecting Wipes (All Scents)	RB	777-114	Wipe

"Main cleaning and disinfection agent should be Confidence plus or its equivalent but in cases this product is not available bleach solution is an alternative as per CDC but this may shorten the use life. For soaping agents body shampoo or wash can be used as long as items are rinsed with adequate water and air dried, assembled and checked properly after."

SCBA - CLEANING

3. In general, only the facepiece requires cleaning and disinfecting after each use. If the apparatus is soiled (i.e. heavy smoke residue, or dirt accumulation) use a **sponge damp with mild soap solution** or use a **soft/medium bristle brush** to remove deposits that may interfere with normal operation of:

- Harness (straps and buckles)
- Cylinder (coupling nut, gauge, outlet connection)
- Cylinder carrier
- Audi-Larm

4. Thoroughly dry the facepiece and regulator after cleaning and disinfecting. Inspect the facepiece as it can trap water which could enter the regulator.

SCBA SERVICE

- **ANNUAL CALIBRATION**
- **HYDRO TEST**

SCBA – CALIBRATION

Average Air Mask Usage*	Recommended Overhaul Frequency	Recommended Flow Test/ Calibration
1 cylinder per day or greater	Every 3 years	Every year
1 cylinder every other day	Every 8 years	Every year
1 cylinder per week or less	Every 15 years	Every year

SCBA Calibration includes functional tests for:

- Exhalation Pressure
- 1st Breath Activation
- Bypass Flow
- Static Facepiece Pressure
- Alarm Activation Pressure
- Facepiece Leakage
- High Pressure Leakage
- Gauge Accuracy
- Static Medium Pressure
- Medium Pressure Change

SCBA – CALIBRATION CERTIFICATE

MSA

Posi3 USB Test Results
Complete SCBA Test

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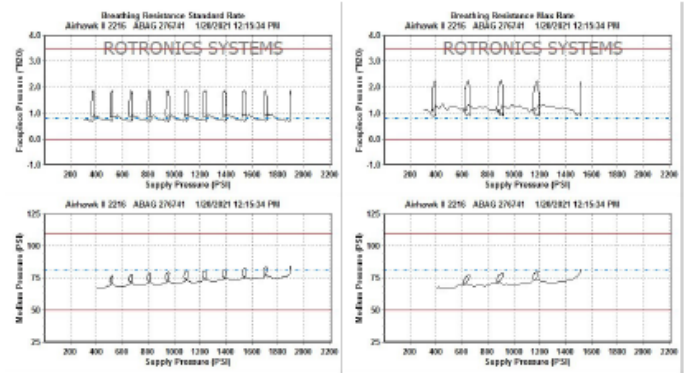
EDC NEGROS

MSA
Airhawk II 2216
S/N: ABAG 276741

Auxiliary IDs	
Facepiece	
Second Stage	
First Stage/Reducer	
Low Pressure Alarm	
Cyl Connector	
Airline Attachment	
Harness	
Visual Inspection	
Facepiece	Pass
Backframe/Harness	Pass
Cylinder	Pass
Low Pressure Warning	Pass
Hoses	Pass
Manifold Volume: 0.178	

Functional Tests			
Static Facepiece Pressure	Pass	0.8	"H2O
Static Medium Pressure	Pass	80.8	PSI
Medium Pressure Creep	Pass	0.0	PSI
1st Breath Activation	Pass	-10.0	"H2O
High Pressure Leakage	Pass	-1	PSI
Bypass Pressure	Pass		
Alarm Activation Pressure			
2216 Whistle	Pass	559	PSI
Ringdown	Pass	136	PSI
Gauge Accuracy			
2216 PSI Numbers	Pass		

500 ±150		1000 ±150	
Pass	539	Pass	956



Minimum		Maximum			Breathing Results	Minimum		Maximum		
0.7	"H2O	1.9	"H2O	Pass	Facepiece Pressure	0.9	"H2O	2.2	"H2O	Pass
67.1	PSI	84.4	PSI	Pass	Medium Pressure	66.7	PSI	81.8	PSI	Pass

Tested by : Ryan Marino
ROTRONICS SYSTEMS INC
3826-A Grass Residences Tower 1 Bagong Pagasa Qc Page 1

Version 4.0.5.18P

Auxiliary IDs	
Facepiece	
Second Stage	
First Stage/Reducer	
Low Pressure Alarm	
Cyl Connector	
Airline Attachment	
Harness	
Visual Inspection	
Facepiece	Pass
Backframe/Harness	Pass
Cylinder	Pass
Low Pressure Warning	Pass
Hoses	Pass
Manifold Volume: 0.178	

Functional Tests			
Static Facepiece Pressure	Pass	0.8	"H2O
Static Medium Pressure	Pass	80.8	PSI
Medium Pressure Creep	Pass	0.0	PSI
1st Breath Activation	Pass	-10.0	"H2O
High Pressure Leakage	Pass	-1	PSI
Bypass Pressure	Pass		
Alarm Activation Pressure			
2216 Whistle	Pass	559	PSI
Ringdown	Pass	136	PSI
Gauge Accuracy			
2216 PSI Numbers	Pass		

500 ±150		1000 ±150	
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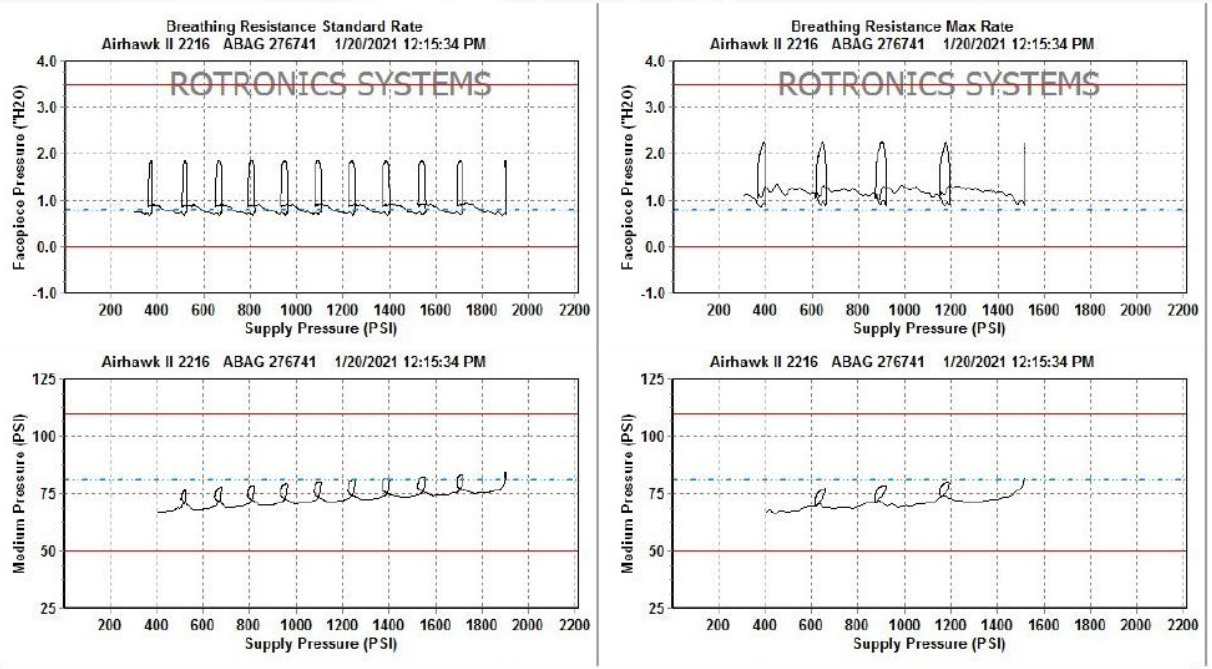

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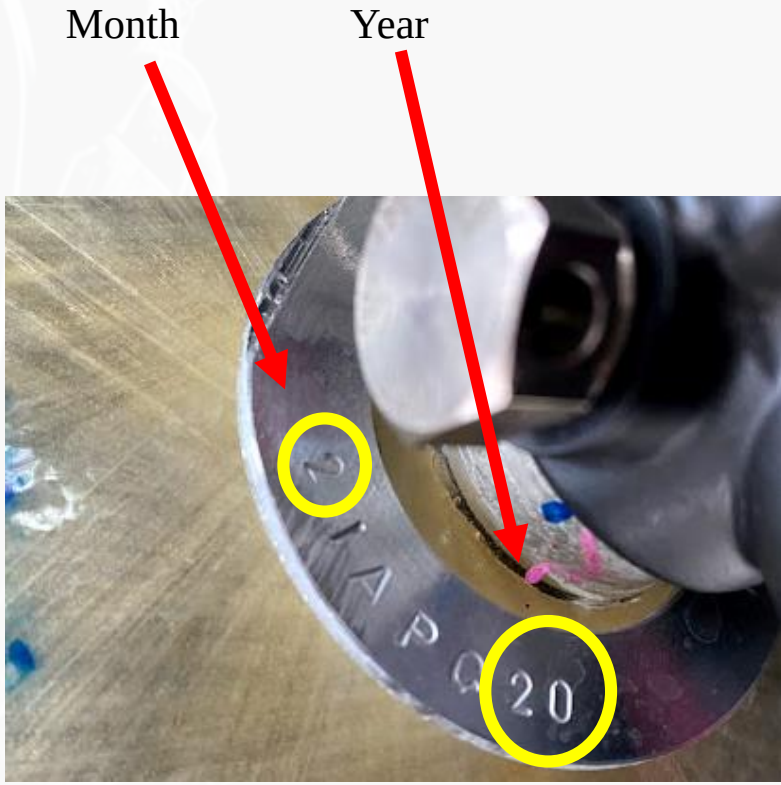
67.1	PSI	84.4	PSI	Pass	Medium Pressure	66.7	PSI	81.8	PSI	Pass

SCBA – HYDRO TEST

Type of Cylinder	Hydro Testing
Carbon Fiber	Every 5 years
Fiberglass Hoop-wound	Every 3 years

Date of Manufacture

Recent Date of Hydrotest



SCBA – COMMON SITUATIONS

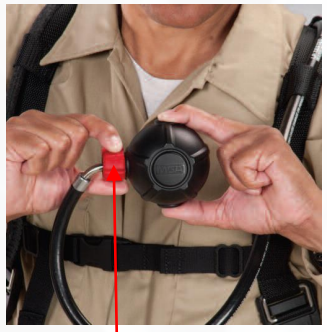
When I open the cylinder valve, there is a leak.

Cause # 1: Bypass is open.
Solution: Make sure bypass is closed before opening the valve.
Cause # 2: Tank is not properly connected to the air frame.
Solution: Coupling nut should be properly threaded..
Cause # 3: Busted/ missing o-ring in high pressure hose connector.
Solution: Replace o-ring.

Coupling Nut

When I open the cylinder valve, first alarm did not activate.

Cause # 1: There is still pressure in the hose connecting to MMR.
Solution: Release pressure from hose by opening the bypass knob.



bypass

Tank cannot be refilled because of leak.

Cause : Busted burst disc and gasket.
Solution: Replace burst disc and gasket.
Note: Carbon cylinders Hydrotest - every 5 years.
Fiberglass hoop-wound cylinders Hydrotest - every 3 years.

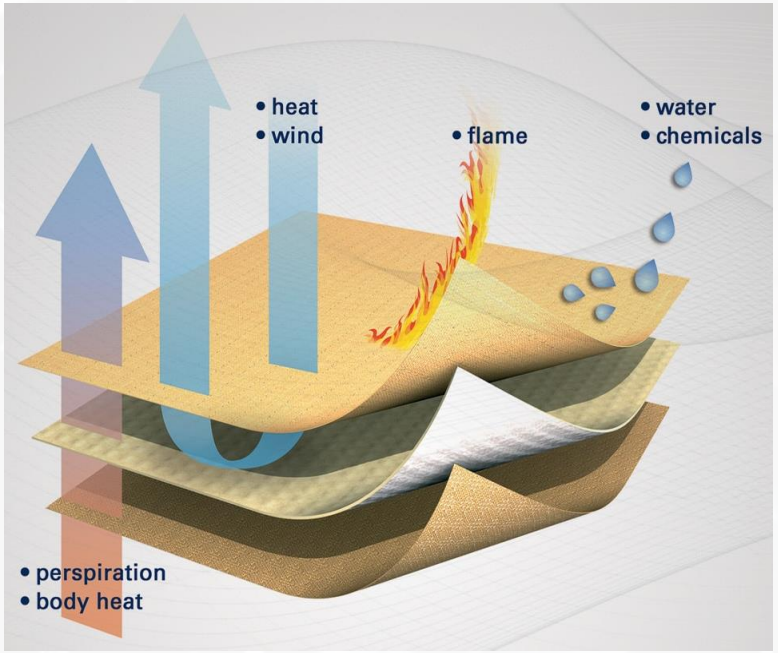
o-ring

During refill, the burst disc leaks.

Cause: Pressure required exceeded.
Solution: Replace burst disc. Assure that cylinder has maximum pressure of ≈ 2216 psi (Yellow indicator)

PERSONAL PROTECTIVE EQUIPMENT

OVERCOAT AND OVERTROUSER



MATERIAL

Outer Layer – protection against heat, flames, abrasions, cuts

Moisture Barrier – protection against the penetration of water, chemicals and pathogens.

*membrane facing outer: insulation and thermal protection

*membrane facing inner: breathability and comfort

Thermal Barrier – creates air cushions and micro climate chambers within the garment and wicking moisture away from the body to increase comfort and minimize heat stress

BRAND

NOVOTEX ISOMAT NTI-112

*Outershell: 75% Nomex Outershell Tough, 23% Kevlar, 2% Antistatic

*Membrane: 100% Polyester knitted with Airtex S

*Thermal Barrier: Carbon fibre, quilted with FR material

APPROVAL

EN469:2005 Level 2

LIFESPAN

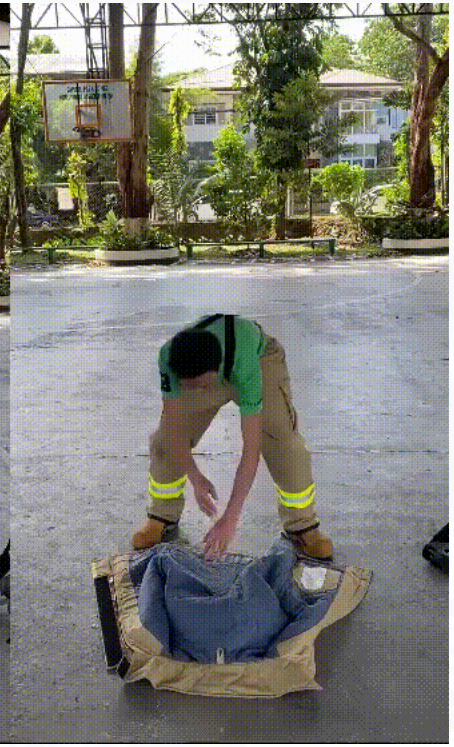
10-11 years

FIREMAN SUIT

“Over-the-head”

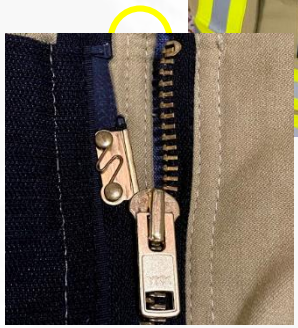
“Normal”

“Cross-arms”



Finger holder

Panic Zipper



BOOTS

MATERIAL

Heat-resistant thermoplastic shell
Ear/Neck Protector made from Nomex and FR cotton
Retro-reflective markings

BRAND

LAKELAND
Bullard LTX Model

APPROVAL

NFPA 1971

LIFESPAN

7 years

BOOTS

MATERIAL

Lining – woven polycotton
Steel Toe Cap – epoxy coated cap
Steel Midsole – non-corrosive stainless steel
Sole / Heel – flame-retardant rubber outsole ; withstand 18kV of live current at dry condition
Chemical Resistance – Sole & Upper – Resistant towards mild acids and alkaline

BRAND

HARVIK RUBBER INDUSTRIES
Model 9867L

APPROVAL

EN 345-2
ANSI class 1

LIFESPAN

Subject to wear and tear

1 year warranty

GLOVES

MATERIAL

Thermo Cowhide Outer Shell
PRO-TECT™ Moisture Barrier – 100% Waterproof/wind-resistant, with excellent abrasion, odour and fungal resistance, low temp flexibility
Self Extinguishing Fleece (SEF) Liner

Two-ply Nomex® Spandex Wristlet with leather pull-tab cuff

BRAND

HONEYWELL
Model GL-7500

APPROVAL

NFPA1971

LIFESPAN

Subject to wear and tear

1 year warranty

HOSE

MATERIAL

EPDM Rubber Lining / Polyester Double Jacket
Poly-Cord™ ring spun polyester warp yarns are combined with filament polyester filler yarns.
Ozone and Abrasion Resistant
Working Test Pressure: 400 psi
Acceptance Test Pressure: 800 psi
Bursting Pressure: 1200 psi

BRAND

North American Fire Hose Corporation
Poly-Tuff 800 Lite™

APPROVAL

Fire Hose – NFPA 1961
Coupling – NFPA 1963

LIFESPAN

10 years

NOZZLE

Stainless Steel spinning teeth

Heavy-duty chrome plated metal shutoff ball for smooth action and long life

MATERIAL

Aluminium alloy body
Rubber bumper
Patterns: Straight Stream, Narrow fog, Wide Fog
Range: 30 , 60 , 90 , 125 GPM

BRAND

PROTEK MANUFACTURING CORP.
Model NST 366

APPROVAL

UL / FM
NFPA 1964

OTHER EQUIPMENT

HAND TOOLS

Axe

Spanner Wrench

FULL FACE GAS MASK

MSA Advantage 3200

- NIOSH Approved
- Soft-sealing Lining made from Hypoallergenic silicone
- 2 GME cartridge able to filter multiple types of vapors

FIRE FIGHTING CABINET

AMBU BAG

hand-held device used to provide positive pressure ventilation to patients who are not breathing or not breathing adequately

PPE CLEANING
(Suit, Gloves, Boots)

- Use sponge damp in mild soap or soft bristle brush to remove surface dirt.
- In most cases, the fireman suit does need to be thoroughly washed.
- Do not use detergent with bleach and fabric softeners.
- Air-dry only. Do not force-dry by placing in a heater or in direct sunlight.

Thank you!