GRAINGER®

FOR THE ONES WHO GET IT DONE

Customer Safety Solutions
from MSA

Occupational Health and Safety

Head, Eye, Face and Hearing Protection •
Respiratory Protection •
Gas Detection •
Fall Protection •

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MSA provides these value-added training resources:

- **Confined space analysis:** MSA conducts plant tours to determine potential confined space hazards.
- **Head and face protection:** MSA can assist with your workplace hazard assessments to offer specific product solutions.
- **Portable gas detection:** MSA offers gas detection product training, including equipment calibration skills.
- **Respiratory protection:** MSA conducts both fit-testing and fit-test training and assists with OSHA compliance program development.

MSA offers **MSA-U**, our on-line training center. Located on MSA's Web site home page, **MSA-U** training and informational materials include:

- Product proper care and use.
- Standards information.
- Instruction manuals.
- Information presented in a variety of formats and languages.

MSA-TV is your online resource for MSA safety equipment videos.

- Short, practical, quick reference videos explaining MSA product features, assembly, use, and maintenance.
- Videos are organized by both product type and market.
- Short clips of MSA products in the news and in your community.

MSA Customer Service Center: 800.672.2222

Web site: www.MSAsafety.com

www.youtube.com/msasafety and *www.facebook.com/MSATheSafetyCompany*

More than ever, customers are concerned about worker safety issues and OSHA compliance. MSA offers total safety solutions to enable company compliance and help to ensure that their employees work safely.

MSA's core competency is safety products; our brand is well-known. MSA designs and manufactures quality-driven products that are supported by the safety industry's largest field representative team.

This booklet provides useful and practical workplace safety information. Together we can provide safety solutions for our customers.

Our Mission: Your Safety!

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Occupational Health and Safety
Head Protection Products for OSHA Compliance

Issue: Workers in many industries are required to wear ANSI/ISEA Z89.1-2009-approved head protection to help protect wearers from a variety of hazards.

Application: Wearing ANSI-compliant head protection helps to minimize worker exposure to specific hazards; exposure hazards determine specific head protection applications.

Recommendation: Grainger offers MSA ANSI-compliant head protection. MSA head protection products are available for many types of hazard protection.

ANSI/ISEA (American National Standards Institute) Z89.1-2009 Requirements for Head Protection:

TYPE I (Top Impact)
- Helmets intended to reduce impact force to top of wearers' heads
- Top impact types are the market's most common hardhat

TYPE II (Top and Lateral Impact)
- Helmets intended to reduce impact force resulting from blows received off-center or to top of wearers' heads
- This helmet type has more specific market applications

Electrical Performance
1. Class E (Electrical): Helmets intended to reduce danger of exposure to high-voltage electrical conductors, proof-tested at 20,000 volts
2. Class G (General): Helmets intended to reduce danger of exposure to low-voltage electrical conductors, proof-tested at 2,200 volts
3. Class C (Conductive): Helmets not intended to provide protection from electrical conductors

Three non-mandatory tests have been added to the updated ANSI/ISEA standard
1. **Reverse donning:** Helmet has been tested to be worn in reverse.
2. **Lower temperature:** Helmet has been tested to lower temperature rating.
3. **High-visibility:** Helmet meets high-visibility requirements.

Product Features and Benefits:

Type I Certified Hardhats:

- V-Gard® Caps and Hats (Class E)

Market applications:

- **V-Gard Helmets:** Agriculture, asbestos abatement, chemical, construction, domestic preparedness, electric utility (V-Gard Helmet only), hazardous materials, indoor air quality, medical, mining, nuclear, oil and gas, paper pulp, blasting, sanding and grinding, spray painting, water and wastewater, welding.

Hazard applications:

- **V-Gard Helmets:** Confined space, electrical shock, overhead falling objects, splash, and welding.

Logo Express® Service Custom Imprinting

- Custom logo imprinting is available on V-Gard Caps and Hat models.

V-Gard Hats and Caps

- Popular styling, lightweight, comfortable
- Meet Class E electrical performance requirements
- Meet voluntary standard for reverse donning and low temperature
- High-density polyethylene shell with UV inhibitors, sizes 6.5-8 inches

Style	Color	MSA Part #	Grainger Item #
V-Gard Slotted Caps, Fas-Trac® Suspension	White	475358	4LN95
	Yellow	475360	4LP03
	Orange	475361	4LN84
	Red	475363	4LN86
	Blue	475359	4LN69
	Green	475362	4LN77
	Gray	475364	1MDV5
	Black	492559	3NXX1
	Pink	495862	3NXX2
	Hi-Viz™ orange	488146	4LN75
	Hi-Viz yellow-green	10061512	1AVR8
	Hi-Viz orange, Y/G stripe	10102193	5KAX1
	Hi-Viz Y/G, R/O stripe	10102233	5KAX2
	Hi-Viz Y/G, silver stripe	10102194	5KAX3

* Helmets meet hi-visibility standard requirements.

Style	Color	MSA Part #	Grainger Item #
V-Gard Non-Slotted Hats, Fas-Trac Suspension	White	475369	4LN96
	Yellow	475366	4MD30
	Red	475371	4RB25
	Blue	475368	4LN70
	Green	475370	4MD32
	Gray	475367	1MDV6
	Hi-Viz orange	10021292	4RB37

** V-Gard Helmets are also available in sizes small and large.

*** Refer to Grainger catalog for listing of MSA ANSI-compliant NFL Licensed V-Gard Helmets and MSA Freedom Series™ V-Gard Helmets.

Style	Color	MSA Part #	Grainger Item #
V-Gard Slotted Caps, Staz-On® Suspension	White	463942	4LN94
	Yellow	463944	4LP02
	Orange	463945	4LN83
	Red	463947	4LN85
	Blue	463943	4LN68
	Green	463946	4LN76

Description	MSA Part #	Grainger Item #
Staz-On Suspension	10087218	4LN50
Fas-Trac Suspension	10087220	4LN52
1-Touch® Suspension	10061123	1AVT4
Swing-Ratchet Suspension	816645	1AVR7

For more information contact your Grainger Representative.

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Occupational Health and Safety
Head Protection Products for OSHA Compliance

Issue: Workers in many industries are required to wear ANSI/ISEA Z89.1-2009-approved head protection to protect wearers from a variety of hazards.

Application: Workers will minimize exposure to specific hazards by wearing ANSI-compliant head protection.

Recommendation: Grainger offers MSA ANSI-compliant head protection. MSA head protection products are available for many types of hazards.

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ANSI/ISEA (American National Standards Institute) Z89.1-2009 Requirements for Head Protection:

TYPE I (Top Impact)
- Helmets intended to reduce force of impact to top of wearer's head
- Type I is the most common hardhat on the market

TYPE II (Top and Lateral Impact)
- Helmets intended to reduce force of impact resulting from blow received off-center or to top of wearer's head
- Type II is generally found within more specific market applications

Electrical Performance
1. Class E (Electrical): Helmets intended to reduce danger of exposure to high-voltage electrical conductors, proof-tested at 20,000 volts
2. Class G (General): Helmets intended to reduce danger of exposure to low-voltage electrical conductors, proof-tested at 2,200 volts
3. Class C (Conductive): Helmets not intended to provide protection from electrical conductors

Non-Mandatory Tests
1. Reverse Donning: Helmets with double-arrow circle are approved to be worn in reverse or with Swing-Ratchet Suspension
2. Lower Temperature: Helmets with LT are approved to lower temperature test. Temperature is lowered from 0F to -22F
3. High Visibility: Helmets with HV meet high-visibility requirements

Market Applications
- SmoothDome®, Vanguard™ and Advance® Helmets: Agriculture, asbestos abatement, chemical, construction, domestic preparedness, electric utility (SmoothDome Helmet only), hazardous materials, indoor air quality, medical, mining, nuclear, oil and gas, paper and pulp, sand blasting, sanding and grinding, spray painting, water and wastewater, welding
- Type II is generally found within more specific market applications

Hazard Applications
- SmoothDome, Vanguard II and Advance Helmets: Confined space, electrical shock (SmoothDome Helmet only), overhead falling objects, splash, and welding
- Skullgard® and Thermalgard® Helmets: Elevated temperatures, overhead falling objects, splash, and welding

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Type I (Top Impact Protection)

SmoothDome Caps
- Lightweight and comfortable; useful for welding applications
- High-density polyethylene shell with UV inhibitors. Size 6.5-8 inches
- ANSI/ISEA Z89.1-2009 (Class E) and CSA Z94.1-2005 (Class E), also Low Temperature- and Reverse Donning-approved

Description	Color	MSA Part #	Grainger Item #
SmoothDome Slotted Caps, Fas-Trac® Suspension	White	10074067	3NXW3
	Yellow	10074069	3NXW5
	Red	10074071	3NXW6
	Blue	10074068	3NXW4
	Hi-Viz™ orange	10074077	3NXW7
	Hi-Viz yellow green	10074084	3NXW8
	Hi-Viz orange w/ Y/G stripe	10095987	4AFX8
	Hi-Viz yellow w/ orange stripe	10095989	4AFX9

Thermalgard Caps
- For use with elevated temperatures
- Glass-reinforced nylon shell material. Size 6.5-8 inches
- ANSI/ISEA Z89.1-2009 (Class G) and CSA Z94.1-2005 (Class G), also Low Temperature- and Reverse Donning-approved

Description	Color	MSA Part #	Grainger Item #
Thermalgard Slotted Caps, Fas-Trac Suspension	Yellow	486959	3NXX3
	White	486960	3NXX4
	Red	486961	3NXX5
	Blue	486963	3NXX6
	Green	814343	3NXX7

Skullgard Hats and Caps
- For use with elevated temperatures
- Glass-reinforced nylon shell material. Size 6.5-8 inches
- ANSI/ISEA Z89.1-2009 (Class G) and CSA Z94.1-2005 (Class G), also Low Temperature- and Reverse Donning-approved

Description	Color	MSA Part #	Grainger Item #
Caps with Fas-Trac Suspension	White	475396	4MD41
	Natural tan	475395	4LN81
Hats with Fas-Trac Suspension	White	475408	4MD47
	Natural tan	475407	4MD46

Type II (Top and Lateral Protection)

Vanguard Helmets
- Fits full range of head sizes
- Polyethylene shell. Size 6.5-8 inches
- ANSI/ISEA Z89.1-2009 (Class E) and CSA Z94.1-2005 (Class E)

Description	Color	MSA Part #	Grainger Item #
Vanguard II Slotted Caps, 4-Point Fas-Trac Suspension	Yellow	804939	3PE96
	White	804940	3PB97
	Red	804944	4RB42
	Blue	804946	4RB43
	Bright orange	804947	4RB44

Bump Caps
- Designed for applications such as food processing and meat packing
- Ventilated sides with inner foam pad. Size 6.5-8 inches
- Bump Caps are NOT safety helmets and do NOT meet OSHA or ANSI requirements for head protection

Description	Color	MSA Part #	Grainger Item #
Bump Cap, 4-point pin-lock suspension	Blue	10033650	4RB45
	Yellow	10033651	4RB46
	White	10033652	4RB47
	Red	10033653	4RB48
	Orange	10033654	4RB49
	Green	10033655	4RB50

For more information contact your Grainger Representative.

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Occupational Health and Safety
Head Protection Accessories for OSHA Compliance

Issue: Workers in many industries are required to wear ANSI-compliant head, face, and hearing protection to help protect wearers from many hazards.

Application: Workers help to minimize exposure to specific hazards by wearing ANSI-compliant head, face, and hearing protection products.

Recommendation: Grainger offers MSA ANSI-compliant head, face, and hearing protection products. MSA products are designed and tested as systems; their compatibility is guaranteed.

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Application: When hearing protection and face protection are required with hardhat.

Sound Blocker™ 26 Earmuff
- Designed for use with MSA slotted cap hardhats
- Uniquely designed to be used with Defender® Faceshield Frame
- Tested and approved to NRR 26 dB

Description	Mounts To	MSA Part #	Grainger Item #
Sound Blocker 26 Earmuff	MSA Slotted Cap	10026398	**1AVR6**

Application: When hearing protection with full-brim hardhat is required.

Soprano Earmuff
- Designed to fit all full-brim hardhats
- Note: Addition of this earmuff reduces helmet's electrical rating to Class C
- Tested and approved to NRR 25 dB

Description	Mounts To	MSA Part #	Grainger Item #
Soprano Earmuff	MSA Non-Slotted Hat	10034487	**5LE91**

Application: When hearing protection with slotted cap hardhat is required.

Sound Control® HPE Earmuff
- Designed for easy attachment to slotted MSA cap-style hardhats
- Easily adjustable and comfortable to wear
- Tested and approved to NRR 27 dB

Description	Mounts To	MSA Part #	Grainger Item #
HPE	MSA Slotted Cap	10061272	**5LE90**

MSA Hardhat Accessories

Application: Added protection from sun when wearing a hardhat.

SunShade Hardhat Accessory

MSA's SunShade Accessory not only helps to protect wearer's ears and neck from sun and heat, it also enhances worker visibility with contrasting color band and reflective striping.

- Breathable, high-visibility mesh fabric
- Hat clips help to keep SunShade Accessory from falling or rotating

Color	Mounts to	MSA Part #	Grainger Item #
Yellow-green	Hats and caps	10098032	**5KAX6**
Orange	Hats and caps	10098031	**5KAX7**

Sun Shield Hardhat Accessory

MSA's Sun Shield Accessory extends hardhat brim all the way around to help protect wearer's ears and neck from sun's rays.

- Made of sturdy polyurethane
- Front portion has smoke tint

Description	Mounts to	MSA Part #	Grainger Item #
Sun Shield Accessory	V-Gard® Standard Cap	697290	**1MDV7**
	V-Gard® Standard Hat	697410	**5KAX8**

Application: Provides additional comfort and absorbs sweat when wearing a hardhat.

Custom Terri-Band Sweatband

- Custom design to fit all MSA hardhats.
- Washable with plastic snaps.

Description	Mounts to	MSA Part #	Grainger Item #
Sweatband, single	All MSA hardhats	10068911	**4RB54**

Application: When a more secure fit is required when wearing a hardhat, chinstrap assists with keeping hardhat on wearer's head.

Chinstrap

- Designed to fit all MSA hardhats
- Elastic material attaches to hardhat suspension

Description	Mounts to	MSA Part #	Grainger Item #
Chinstrap	All MSA Hardhats	81391	**4RB41**

Application: Provides secure fit when protective goggle and hardhat are required to be worn together.

Goggle Retainer

- Sturdy neoprene-rubber accessory can be used with any protective MSA hardhat
- Retains goggle on hardhat when not in use and holds goggle securely when worn for eye protection
- MSA goggle retainers are for use with MSA goggles for ANSI compliance

Color	Mounts to	MSA Part #	Grainger Item #
Goggle Retainer	MSA cap-style helmet	459458	**4LP06**
Goggle Retainer	MSA hat-style helmet	449895	**4MC42**

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For more information contact your Grainger Representative.

Occupational Health and Safety
Hearing Protection Products for OSHA Compliance

Issue: Workers in many industries are required to wear ANSI-compliant hearing protection due to a variety of work-related noise hazards.

Application: When ANSI-compliant hearing protection products are used correctly , workers will minimize their exposure to particular noise hazards.

Recommendation: Grainger offers MSA ANSI-compliant hearing protection products that are designed and tested as systems, therefore, compatibility is guaranteed when used, for example, with MSA hardhats.

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Use of hearing protection products such as MSA's left/RIGHT® Ear Muffs can be an integral part of your Hearing Conservation Program.

According to OSHA's Occupational Noise Standard 29 CFR 1910.95 requirements:
- Employers shall protect employees from levels of noise of over 90 decibels during an eight-hour average.
- OSHA prefers engineering or administrative controls, but accepts hearing protection (such as left/RIGHT Hearing Protection products).
- Implementation of a Hearing Conservation Program is necessary if noise levels are above 85 dbA TWA on average.

A Hearing Conservation Program has two main components:
- Hearing protection that is available to other employees; the facility may enforce use.
- Required training for all affected employees.

Noise hazards include:
- Constant exposure to loud noise that can damage hearing.
- Noise-related hearing loss that is not curable.
- Noise-related hearing loss that can affect an individual's ability to understand human speech.

Market Applications:
- **Low (NRR 21)**
  - Landscaping, light industry, pharmaceutical, warehousing, utilities, nuclear, hazardous materials, automotive assembly
- **Medium (NRR 25)**
  - Oil, gas, petrochemical, construction, agricultural, forestry, food and beverage, general industry, pulp and paper
- **High (NRR 28)**
  - Aviation, airports, heavy industry, mining, engine rooms, metal fabrication, sanding and grinding, firearms

MSA left/RIGHT Hearing Protection products are third-party tested in accordance with CSA Class A, EN352-3 and ANSI S3.19-1974.

Left/RIGHT Passive Hearing Protection Ear Muffs

Unique features of MSA left/RIGHT Ear Muffs:

- Patent-pending designs create a uniquely comfortable ear muff.
  - Left cup is different from the right cup for a more customized fit, as we are all different shapes and sizes.
  - Cups are large enough to fit all ear sizes, allowing users to employ properly-fitting hearing protection.
  - Headband contours to the head's actual curves, reducing pressure points for custom fit.
- Each muff can be individually adjusted to users' ear angle and position to enable comfortable and well-fitting ear muffs.

Key point: MSA head protection products are tested as systems with MSA hearing protection products; when these products are used together, the **NRR rating is the actual rating.**

- Often when different manufacturers' products are used together (Brand A ear muff on a Brand B helmet), the ear muff's NRR rating does **not** reflect the actual rating for which the ear muff is approved.
- NRR ratings for MSA ear muffs, when used on MSA helmets, are the actual ratings for which the products are approved.

Application: When hearing protection is required.

Left/RIGHT Passive Hearing Headband Ear Muff

- Headband is designed for balanced, comfortable fit.
- Muff is easily adjustable and comfortable to wear.

Description	Color and NRR	MSA Part #	Grainger Item #
Low	White, NRR 21	10087436	**6CCY5**
Medium	Blue, NRR 25	10087426	**6CCY6**
High	Yellow, NRR 28	10087399	**6CCY7**

Application: When hearing protection with a slotted cap is required.

Left/RIGHT Passive Hearing Helmet-Mounted Ear Muff

- Designed for easy attachment to slotted MSA cap-style helmets.
- Easily adjustable to offer customized fit.

Description	Color and NRR	MSA Part #	Grainger Item #
Low	White, NRR 21	10087439	**6CCY2**
Medium	Blue, NRR 25	10087429	**6CCY3**
High	Yellow, NRR 28	10087422	**6CCY4**

Hygiene Kits for both helmet-mounted and headband model left/RIGHT Ear Muffs

- Hygiene kits help to ensure that muffs stay clean and comfortable.
- It is recommended that the ear-seal rings are replaced every six months.

Description	MSA Part #	Grainger Item #
Low Hygiene Kit	10092878	**6CCY8**
Medium Hygiene Kit	10092879	**6CCY9**
High Hygiene Kit	10092880	**6CCZ0**

For more information contact your Grainger Representative.

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Occupational Health and Safety
V-Gard Accessory System for OSHA Compliance

Issue: Workers in a variety of industries are required to wear ANSI/ISEA Z87.1-approved face protection to protect them from a variety of hazards.

Application: Wearing face protection that is compliant to the ANSI standard minimizes exposure to a particular hazard. Industries have varying levels of hazards, and the exposure risk determines the specific face protection application.

Recommendation: Grainger offers ANSI-compliant face protection products from MSA. MSA face protection products are available for virtually any type of hazard protection and are tested and approved for use with MSA head protection and hearing products.

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ANSI (American National Standards Institute)/ISEA Z87.1 Requirements for Face Protection:

Z87.1 covers the description, general requirements, testing, marking, selection, care and use of protectors designed to minimize or prevent eye and face injuries from impacts, and non-ionizing radiation. Protectors covered by this standard are designed for use during machinery operations, welding, cutting, assembly, etc.

The Standard mentions that protective components intended for use as part of an assembly must be tested as an assembly. Also, component packaging must list all other components with which it has been tested. MSA's V-Gard Accessory system complies with these statements.

MSA V-Gard Accessory Frames and Visors

All visors except wire screen meet ANSI/ISEA Z87.1-2010 Standard when used on any MSA V-Gard Accessory System frame.
- In addition, only V-Gard Accessory products are tested and approved as a fully-integrated system to work with MSA protective helmets.
- The entire system is designed for easy frame and visor installation/removal, and compatibility with earmuffs, half-mask respirators and other PPE.
- With global approvals and one part number, customers worldwide can utilize this system, reducing inventory costs and increasing efficiency.

V-Gard Universal Frames for Slotted or Non-Slotted MSA Caps
- Designed to fit any MSA protective cap or hat.
- Non-metal construction enables use in electrical applications.
- Elevated temperature designed to withstand temperatures of 350 °F (176.7 °C)

Description	Mounts to	MSA Part #	Grainger Item #
Frame, with Debris Control	Hard Caps	10115822	**12V759**
Frame, no Debris Control	Hard Caps	10121268	**12V760**
Frame, Elevated Temperatures	Hard Caps	10116552	**TBD**

V-Gard Frames for Slotted MSA Caps

- Stowable slot adaptors allow frames to work with or without earmuffs.
- Replaceable debris-control creates a tight seal between the helmet and the frame.
- Elevated temperatures (ET) frame designed to withstand temperatures of 350 °F (176.7 °C)

Description	Mounts to	MSA Part #	Grainger Item #
Frame, with Debris Control	MSA Slotted Caps	10115730	**12V755**
Frame, no Debris Control	MSA Slotted Caps	10121266	**12V756**
Frame, ET, with Debris Control	MSA Slotted Caps	10115821	**12V757**
Frame, ET, no Debris Contorl	MSA Slotted Caps	10121267	**12V758**

V-Gard Accessory Chin Protectors and Debris Control

- V-Gard Chin Protectors work as a system with select V-Gard Nitrometer Visors to help provide extra protection from impact and splash hazards to face and neck.
- Unique retractable plates allow greater flexibility of head movement both up and down, and well as side-to-side (12V770).
- Compact, lightweight design provides additional protection between chin and neck area (12V769).

Description	Mounts to	MSA Part #	Grainger Item #
Retractable Chin Protector	Nitrometer Visors	10115828	**12V770**
Standard Chin Protector	Nitrometer Visors	10115827	**12V769**
Replacement Debris Control	V-Gard Cap Frames	10116539	**12V761**

Visors

- Polycarbonate: Suitable for most applications where impact hazards exist. Provides UV protection unless otherwise noted.
- Propionate: Provides chemical splash resistance. Good for applications where chemical splash hazards exist.
- Wire Mesh: Provides maximum ventilation in humid working conditions. Not for use in splash applications.
- Nitrometer: Visor version is used with chin protection.

Description	Color	Dimensions (inches): W-H- Thickness	MSA Part #	Grainger Item #
Polycarbonate, Flat, non-CSA	Clear	7.5 x 17 x 0.040	10117750	**12V764**
Polycarbonate, Flat, non-CSA	Clear	7.5 x 17 x 0.060	10117782	**12V766**
Polycarbonate, Flat, non-CSA	Clear	9.5 x 17 x 0.040	10118094	**12V768**
Propionate, Molded	Clear	7.5 x 17 x 0.098	10115855	**12V771**
Polycarbonate, Nitrometer, non-CSA	Clear	7.5 x 17 x 0.060	10117781	**12V765**
Polycarbonate, Nitrometer, non-CSA	Clear	7.5 x 17 x 0.060	10117783	**12V767**
Wire Mesh, Plastic Edge	N/A	7.5 x 17 x N/A	10116557	**12V762**
Wire Mesh, Plastic Edge, Nitrometer	N/A	7.5 x 17 x N/A	10116558	**12V763**

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Occupational Health and Safety
Head Protection Products for OSHA Compliance

Issue: Employers in many industries request hardhat customization using a unique custom logo. In response, MSA offers a custom logo program providing this head protection added feature.

Application: MSA head protection products can be ordered with customized unique logo or other artwork. Customers typically prefer hardhats imprinted with their company logo or with specifics themes such as VISITOR or SAFETY FIRST. Adding logos to hardhats does not affect ANSI compliance.

Recommendation: Grainger offers the added feature of custom logos for MSA head protection.

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Logo Requirements for Head Protection:

Image Requirements
- 300 dpi minimum
- Font style and size if possible
- PMS color numbers for logo colors

Image File
- Save files in their native format, such as Vector Files, Corel Draw, Illustrator, Freehand, or Photoshop. Vector Files are preferred. For handling text, you must use the "create outline" option, or "convert to curve" option.
- Save all rasterized files, such as JPEG, TIFF, etc., at 300 dpi minimum. The greater the resolution, the better the reproduction quality.

Order Requirements
Minimum order quantity is 20 hardhats (exceptions for the Skullgard Helmet and Bump Cap models however).
- Style mix: Orders using the same custom logo may mix cap and hat style hardhats.
- Model mix: Orders for two different hardhat models are allowed; however, models on the same order are limited to V-Gard and Advance Helmets.
- Color mix: An order for different colors of the same model is allowed; color mix must be in quantities of 20 hardhats.
- Size mix: An order for different hardhat sizes is allowed. Orders below 100 hardhats of one size only are considered to be two separate logo orders. If 100 hardhats of one size are ordered, order price will reduce for meeting 100 level threshold.
- In all cases logo imprinting must use the same logo or set of logos. Changes will separate logo orders and pricing.

Logo:
- Extremely scratch-resistance and durable
- Water-proof and UV-resistant

MSA can now ship your new custom-imprinted logo helmets (in minimum quantities of as few as 20) in five working days after artwork proof is approved.

MSA's Logo Express® Service offers choice of two types of logo imprinting services:
1. Our standard printing process prints up to four logo colors on hardhats.
2. Or, choose our Image2000sm Service premium process. This process reproduces photographic images onto the surface of standard-size white V-Gard Helmets.

Market applications:
- Applications for logo hardhats: Agriculture, asbestos abatement, chemical, construction, domestic preparedness, electric utility (V-Gard Helmet only), hazardous materials, indoor air quality, medical, mining, nuclear, oil and gas, paper and pulp, sand blasting, sanding and grinding, spray painting, water and wastewater, welding.

Compliance

Custom logos do not affect hardhat compliance. For example, if the hardhat is ANSI-approved, it still maintains that approval.

Custom Logo Process Made Simple
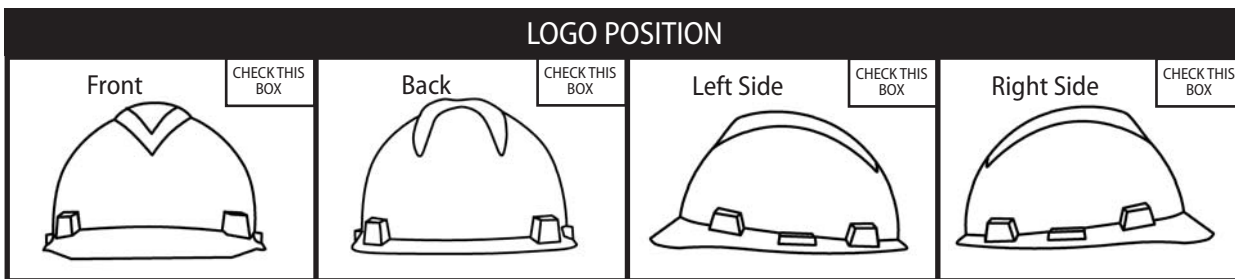
Step 1: Choose your hardhat
- Refer to Grainger catalog for a list of MSA hardhats. For MSA hardhats not mentioned in the catalog, please see MSA's catalog or helmet bulletins.

All MSA hardhats can have a custom logo
- MSA's Bump Cap may have only a one-color logo on front.

If the logo has been ordered previosuly through another channel partner, a customer letter is required informing MSA that Grainger is authorized to order this logo.

Step 2: Custom logo position

LOGO POSITION

Front	CHECK THIS BOX	Back	CHECK THIS BOX	Left Side	CHECK THIS BOX	Right Side	CHECK THIS BOX

Step 3: Your custom logo
- Color(s): To receive colors that most accurately match your logo, we recommend that you use the universally-known Pantone Matching System (PMS), where each color is represented by a number.
- Logo size: If not stated, logo will be sized to appear as large as possible.
- Font style: If needed, please note font style of text.
- Number of colors: Color limit is four separate colors when using our standard logo process.

Step 4: Approval process
- After MSA's Logo Express Service receives all information and artwork required to customize your hardhats, and before producing the hardhats, you will be provided with a finished design proof.

Questions
Please contact us at 800.MSA.LOGO (800.672.5646) with any questions regarding MSA's Logo Express Service.

For more information contact your Grainger Representative.

MSA
The Safety Company

Occupational Health and Safety
Respiratory Protection Products for OSHA Compliance

Issue: Workers in many industries are required to use NIOSH- (National Institute of Safety and Health) approved respiratory products for proper respiratory protection against a variety of airborne hazards.

Application: Use of proper NIOSH-approved, OSHA-compliant respiratory personal protective equipment helps to minimize exposure to specific hazards. Some hazards have different protection requirements; exposure severity determines the proper level of required respiratory protection.

Recommendation: Grainger offers MSA NIOSH-approved, OSHA-compliant respiratory personal protective equipment for many industries and applications. MSA air-purifying and supplied-air respiratory products can assist with attaining industry compliance.

OSHA Respiratory Protection Standard (29 CFR 1910.134) Key Elements:

The fundamental goal of any respiratory protection program is to control occupational diseases caused by breathing air contaminated with potentially harmful airborne hazards. Listed here are seven key elements that every respiratory protection program should contain:

1. A written plan detailing program administration.
2. A complete assessment and knowledge of respiratory hazards that are likely to be encountered in the workplace.
3. Procedures and equipment to control respiratory hazards, including use of engineering controls and work practices designed to limit or reduce employee exposures to such hazards.
4. Guidelines for proper selection of appropriate respiratory protective equipment.
5. An employee training program covering hazard recognition, dangers associated with respiratory hazards, and proper care and use of respiratory protective equipment.
6. Inspection, maintenance, and repair of respiratory protective equipment.
7. Medical surveillance of employees.

Respiratory Fit Testing

• OSHA requires fit testing for any face mask (full- or half-mask) designed to provide a tight seal along the face, whether it is used in positive- or negative-pressure mode, and whether or not it is disposable.
• Qualitative fit test methods are subjective in nature and rely upon judgment of test subjects. These methods are essentially pass/fail fit tests to assess respirator fit adequacy.
• Quantitative testing methods rely upon objective data to determine proper fit. An assessment of respirator fit adequacy is determined by numerically measuring respirator leakage amount.
• If required fit factor is greater than 100, i.e. when higher levels of respiratory protection are needed, quantitative fit-testing must be conducted.

Advantage® 200LS Half-Mask Respirator

- Unmatched respirator fit and comfort.
- MultiFlex® System is designed to equalize pressure on the faceseal area pressure.
- Respirator and cartridges are NIOSH-approved to 42 CFR, Part 84.

Description	Size	MSA Part #	Grainger Item #
Advantage 200 LS Half-Mask, Single Neckstrap	Small	815448	**4LR46**
	Medium	815444	**4LR40**
	Large	815452	**4LR32**

Advantage 3000 Full-Facepiece Respirator

- Features a wraparound lens for superior visibility and peripheral vision.
- Soft, pliable silicone facepiece is designed for all-day comfort.
- Respirator and cartridges are NIOSH-approved to 42 CFR, Part 84.

Description	Size	MSA Part #	Grainger Item #
Advantage 3000 Full-Facepiece	Small	10031340	**3PB92**
	Medium	10031309	**3PB93**
	Large	10031341	**3PB94**

Advantage Respirator Cartridges

- Cartridges are designed for easy attachment to respirator.
- Cartridges are designed to minimize wearers' breathing resistance.
- Cartridges and filters are sold in packages of two.

Description	Approved For*	Color Code	MSA Part #	Grainger Item #
GMA	OV	Black	815355	**4LM93**
GMA-P100	OV, P100	Black/magenta	815362	**4LN01**
GMB	OV, SO_2, ClO_2, HCl	White	815356	**4LM94**
GMB-P100	OV, SO_2, ClO_2, HCl, P100	White/magenta	815363	**4LN02**
GMC	OV, Cl, SO_2, ClO_2, HCl	Yellow	815357	**4LM95**
GMC-P100	OV, Cl, SO_2, ClO_2, HCl, P100	Yellow/magenta	815364	**4LN03**
GMD	NH_3, methylamine	Green	815358	**4LM96**
GMD-P100	NH_3, methylamine	Green/magenta	815365	**4LN04**
GME	OV, Cl, SO_2, ClO_2, HCl, NH_3, methylamine, formaldehyde, hydrogen fluoride	Olive	815359	**4LM97**
GME-P100	OV, Cl, SO_2, ClO_2, HCl, NH_3, methylamine, formaldehyde, hydrogen fluoride, P100	Olive/magenta	815366	**4LN05**
Mersorb® Cartridge	Cl, mercury	Olive/black	815361	**4LM99**
Mersorb-P100 Cartridge	Cl, mercury, P100	Olive/magenta	815368	**4LN07**
Low-Profile Cartridge	P100	Magenta	815369	**4LN08**
Flexi-Filter® Pad	P100	Magenta	818342	**6JR29**
Flexi-Filter Pad	N95	White	818346	**6JR31**
Flexi-Filter Pad	N95, OV	Black	818347	**1DKR7**

*   OV (organic vapors), SO2 (sulfur dioxide), ClO2 (chlorine dioxide), HCl (hydrogen chloride) Cl (chlorine), NH3 (ammonia).

For more information contact your Grainger Representative.

MSA
The Safety Company

Occupational Health and Safety
Respiratory Protection Products for OSHA Compliance

Issue: Workers in many industries are required to use NIOSH-approved (National Institute of Safety and Health) respiratory products for proper respiratory protection against a variety of airborne hazards.

Application: Using proper OSHA-compliant and NIOSH-approved personal protective respiratory equipment minimizes exposure to specific hazards.

Recommendation: Grainger offers NIOSH-approved, OSHA-compliant MSA personal protective respiratory equipment for many industries and applications. MSA air-purifying and supplied-air respiratory products can assist you with industry compliance.

OSHA Respiratory Protection Standard (29 CFR 1910.134) Key Elements:

The fundamental goal of any respiratory protection program is to control occupational diseases caused by breathing air contaminated with harmful airborne hazards. Listed here are seven key elements that every respiratory protection program should contain:

1. A written plan detailing program administration.
2. A complete assessment and knowledge of respiratory hazards that are likely to be encountered in the workplace.
3. Procedures and equipment to control respiratory hazards, including use of engineering controls and work practices designed to limit or reduce employee exposures to such hazards.
4. Guidelines for proper selection of appropriate respiratory protective equipment.
5. An employee training program covering hazard recognition, dangers associated with respiratory hazards, and proper care and use of respiratory protective equipment.
6. Inspection, maintenance, and repair of respiratory protective equipment.
7. Medical surveillance of employees.

Respiratory Fit Testing

- OSHA requires fit testing for any face mask (full- or half-mask) designed to provide a tight seal along the face, whether it is used in positive- or negative-pressure mode, and whether or not it is disposable.
- Qualitative fit test methods are subjective in nature and rely upon judgment of test subjects. These methods are essentially pass/fail fit tests to assess respirator fit adequacy.
- Quantitative testing methods rely upon objective data to determine proper fit. An assessment of respirator fit adequacy is determined by numerically measuring respirator leakage amount.
- If required fit factor is greater than 100, i.e. when higher levels of respiratory protection are needed, quantitative fit-testing must be conducted.

Air-Purifying Solutions

Application: Many industrial applications such as confined space entry, emergency situations at waste water treatment facilities, and hazardous material response work.

Advantage® 400 Half-Mask Respirator

The Advantage 400 Respirator is designed to pass the proposed NIOSH fit test panel, meaning a higher degree of protection for large numbers of workers.

- With only three major components, Advantage 400 Respirator reduces cost of ownership
- AnthroCurve™ II Sealing Surface adapts perfectly to multi-ethnic head sizes and facial contours
- Respirator and cartridges are NIOSH-approved to 42 CFR, Part 84

Description	Size	MSA Part #	Grainger Item #
Advantage 400 Half-Mask Respirator, double neckstrap	Small	10102182	**5JGE5**
	Medium	10102183	**5JGE6**
	Large	10102184	**5JGE7**

Advantage 4000 Full-Facepiece Respirator

- Features wraparound lens for superior visibility and peripheral vision
- Soft, pliable silicone rubber facepiece is designed for all-day comfort
- Can be used in air-purifying or supplied-air applications, simplifying fit testing and reducing inventory costs
- Respirator and cartridges are NIOSH-approved to 42 CFR, Part 84

Description	Size	MSA Part #	Grainger Item #
Advantage 4000 Full-Facepiece Respirator, single-port, no adaptor	Small	10083798	**2YRD5**
	Medium	10083794	**2YRD6**
	Large	10083802	**2YRD7**
Twin-Cartridge Adaptor	Not applicable	10065328	**4DKY8**

Advantage Respirator Cartridges

- Cartridges are designed for easy attachment to facepiece
- Cartridges are designed to minimize wearers' breathing resistance
- Cartridges and filters are sold in packages of two

Description	Approved For*	Pressure	MSA Part #	Grainger Item #
GMA	OV	Black	815355	**4LM93**
GMA-P100	OV, P100	Black/magenta	815362	**4LN01**
GMB	OV, SO_2, ClO_2, HCl	White	815356	**4LM94**
GMB-P100	OV, SO_2, ClO_2, HCl, P100	White/magenta	815363	**4LN02**
GMC	OV, Cl, SO_2, ClO_2, HCl	Yellow	815357	**4LM95**
GMC-P100	OV, Cl, SO_2, ClO_2, HCl, P100	Yellow/magenta	815364	**4LN03**
GMD	NH_3, methylamine	Green	815358	**4LM96**
GMD-P100	NH_3, methylamine	Green/magenta	815365	**4LN04**
GME	OV, Cl, SO_2, ClO_2, HCl, NH_3, methylamine, formaldehyde, hydrogen fluoride	Olive	815359	**4LM97**
GME-P100	OV, Cl, SO_2, ClO_2, HCl, NH_3, methylamine, formaldehyde, hydrogen fluoride, P100	Olive/magenta	815366	**4LN05**
Mersorb® Cartridge	Cl, mercury	Olive/black	815361	**4LM99**
Mersorb	Cl, mercury, P100	Olive/magenta	815368	**4LN07**
Low-Profile Cartridge	P100	Magenta	815369	**4LN08**
Flexi-Filter® Pad	P100	Magenta	818342	**6JR29**
Flexi-Filter Pad	P100, OV, ozone	Magenta	818343	**6JR30**
Flexi-Filter Pad	P100, AG, HF	Magenta	818344	**2ETH4**
Flexi-Filter Pad	N95	White	818346	**6JR31**
Flexi-Filter Pad	N95, OV	Black	818347	**1DKR7**

* OV (organic vapors), SO_2 (sulfur dioxide), ClO_2 (chlorine dioxide), HCl (hydrogen chloride), Cl (chlorine), NH_3 (ammonia).

MSA
The Safety Company

Occupational Health and Safety
Respiratory Protection Products for OSHA Compliance

Issue: Workers in many industries are required to use NIOSH- (National Institute of Safety and Health) approved respiratory products for proper respiratory protection against a variety of airborne hazards.

Application: Use of proper respiratory personal protective NIOSH-approved, OSHA-compliant equipment helps to minimize particular hazard exposures. Some hazards have different protection requirements; the exposure's severity determines required respiratory protection.

Recommendation: Grainger offers MSA NIOSH-approved, OSHA-compliant personal protective respiratory equipment for use in many industries and applications. MSA air-purifying and supplied-air respiratory products can assist you in reaching proper industry compliance.

OSHA Respiratory Protection Standard (29 CFR 1910.134) Key Elements:

The fundamental goal of any respiratory protection program is to control occupational diseases caused by breathing air contaminated with harmful airborne hazards. The following lists seven key elements that every respiratory protection program should contain:

1. *Written plan* detailing the program administration.
2. *Complete assessment* and knowledge of respiratory hazards that are likely to be encountered in the workplace.
3. *Procedures and equipment* to control respiratory hazards, including use of engineering controls and work practices designed to limit or reduce employee exposures to such hazards.
4. Guidelines for *proper selection* of appropriate respiratory protective equipment.
5. *Employee training program* covering hazard recognition, dangers associated with respiratory hazards, and proper care and use of respiratory protective equipment.
6. *Inspection, maintenance, and repair* of respiratory protective equipment.
7. *Medical surveillance* of employees.

Respiratory Fit Testing

- OSHA requires fit testing for any face mask (full- or half-mask) to achieve tight seal along user's face, whether it is used in positive- or negative-pressure mode, and whether or not it is disposable.

- Qualitative fit test methods are subjective in nature and rely on the test subject's judgment. Qualitative fit tests are essentially pass/fail in assessing respirator fit adequacy.

- Quantitative testing methods rely on objective data to determine proper fit. An assessment of respirator fit adequacy is determined by numerically measuring respirator leakage amount.

- If required fit factor is greater than 100, i.e. when higher levels of respiratory protection are needed, quantitative fit-testing must be conducted.

Application: Any situation where a higher level of respiratory protection is required. This PAPR offers many headgear and cartridge options and is useful for many market applications.

OptimAir® TL Powered Air Purifying Respirator (PAPR)

The OptimAir TL PAPR incorporates sleek, low-profile design for user comfort never before offered in a PAPR. Entire system affords lightweight comfort and fit as well as incorporating many "smart" features.

- "Smart" features include crush-proof breathing tube, automatic flow rate setting, audible and visual alarms, and better weight distribution

- Motor blower unit offers slim, curved housing design, helping to minimize fatigue and permits work in tight confined areas

- NIOSH-approved

Description	System	MSA Part #	Grainger Item #
PAPR Kit includes housing, tube, battery pack, charger, belt	For use with hood	10081116	**2YRC9**
	For use with facepiece	10081114	**2YRD1**

Description	Option	MSA Part #	Grainger Item #
Hood	Tychem QC	10083330	**2YRE2**
Hood	Tychem SL	10083382	**2YRE3**
Facepiece, small	Advantage® 4000 Facepiece	10083798	**2YRD5**
Facepiece, medium	Advantage 4000 Facepiece	10083794	**2YRD6**
Facepiece, large	Advantage 4000 Facepiece	10083802	**2YRD7**
Facepiece adaptor	RD-40 Adaptor (required)	10065330	**2YRD8**

Description (pk 6)	Color Code	MSA Part #	Grainger Item #
P100	Magenta	10080455	**2YRD2**
OV, AC, P100	Yellow/magenta	10080454	**2YRD3**
AG, AM, FM, P100	Olive/magenta	10080456	**2YRD4**

Application: Used for abatement (asbestos), nuclear, lead, and other hazardous particulate environments.

OptimAir MM2K Powered Air Purifying Respirator (PAPR)

Mask-mounted motor blower with HEPA filter has low-profile design that enhances user maneuverability and simplifies decontamination.

- Uses small, lightweight, water-resistant battery pack that operates for eight hours

- System uses comfortable and lightweight Advantage 3000 Facepiece

- NIOSH-approved

Description (pk 6)	Size	MSA Part #	Grainger Item #
Complete OptimAir MM2K Assembly	Medium	10034150	**4AFV6**
	Large	10034151	**4AFV7**
P100 filters (6-pck)	Magenta (color)	496081	**4LR73**

Application: Suitable for ventilated areas with relatively stable contaminant concentration levels.

Advantage Chin-Type Gas Mask

- System uses small, lightweight canister to reduce fatigue; also permits downward head movement

- Uses comfortable and lightweight Advantage 3000 Facepiece

- NIOSH-approved

Description	Size	MSA Part #	Grainger Item #
Advantage 3000, Silicone Facepiece	Small	10031343	**1MBJ3**
	Medium	10031342	**1MBJ4**
	Large	10031344	**1MBJ5**

Description	Color Code	MSA Part #	Grainger Item #
PH, AM, CL, P100	Olive/magenta	10059903	**1MBH8**
OV, P100	Black/magenta	10067469	**1MBH9**
HF, P100	Olive/magenta	10067491	**1MBJ1**
FM, AG, CD, HS, P100	Olive/magenta	10067470	**1MBJ2**

For more information contact your Grainger Representative.

MSA
The Safety Company

Occupational Health and Safety
Supplied Air Products for OSHA Compliance

Issue: Workers in many industries encounter hazards which require use of supplied-air respiratory systems, either in preparation for potential emergency escape, or for emergency response within IDLH (immediately dangerous to life or health) situations. A potentially hazardous environment common to various industries is confined space, a scenario that may require use of portable gas detection instruments and other PPE (personal protective equipment). Supplied-air respiratory products may also be required during confined space work. ANSI Z117.1-2003 establishes procedures, performance requirements, and minimum safety requirements for confined space operations.

Application: A confined space is defined by ANSI Z117.1-2003 as "an enclosed area that is large enough and so configured that an employee can bodily enter and has the following characteristics: its primary function is something other than human occupancy AND has restricted entry and exit." Confined spaces represent major health and safety risks for many employees. The ability to recognize and plan appropriately for confined space work can mean the difference between a job well done and disaster.

Recommendation: Grainger offers personal protective equipment such as MSA supplied-air respiratory products to meet confined space safety requirements as defined by ANSI Z117.1-2003.

MSA
The Safety Company

Confined Space Markets and Applications:

Confined spaces exist in many sizes and shapes and may be found in the following markets: heavy industry, food, chemical and petroleum processing, utility and communications installations, and construction sites to name a few.

The following areas are typically classified as confined spaces and should be treated with caution: storage tanks, pump wet wells, degreasers, sewers, manholes, tunnels, underground vaults, boilers, silos, vessels, grain elevators, mixers, open-topped water tanks, water towers, enclosures with bottom access, and railcar tanks.

Respiratory Protection Solutions for Confined Space:

Once the atmosphere of a confined space has been analyzed, proper respiratory protection equipment should be selected for all entrants working within the confined space. Supplied-air respirators such as SCBA (self-contained breathing apparatus) and supplied-airline respirators are common product applications due to potential risk of oxygen deficiency and contaminant concentrations. Air-purifying respirators should not be used for confined space entry unless known conditions exist and can be maintained.

Supplied-Air Solutions

Application: Emergency escape from toxic environments, including IDLH atmospheres.

TransAire® Escape Respirators

- Quality supplied-air escape respirators offer rapid, uncomplicated escape from IDLH atmospheres
- Lightweight and unobtrusive cylinders for easy egress from tightly-spaced areas
- Air flows directly to lens, minimizing fogging; fits easily over eye glasses and full beards
- Withstands exposure from temperatures from 0F to 160F

Description	MSA Part #	Grainger Item #
TransAire Respirator 5, 5-minute	10008292	**1DKR8**
TransAire Respirator 10, 10-minute	10008293	**1DKR9**

Application: Many industrial applications such as confined space entry, emergency situations at waste water treatment facilities, and hazardous material response work.

AirHawk® ll Air Mask

- Durable air frame carrier and harness assembly comes standard with large sidehandles and central attachment point to pull workers to safety in rescue scenarios
- PR-14™ First-Stage Regulator is designed with the fewest number of parts in the industry and can be maintained without special tools
- Firehawk® PTC (Push-to-Connect) Regulator has only 22 replaceable parts, making cost of ownership very low
- Uses versatile and comfortable full-mask Advantage® 4000 Facepiece
- NIOSH-approved

Description	MSA Part #	Grainger Item #
AirHawk ll Air Mask, Advantage 4000 Facepiece, 30-minute aluminum cylinder	10095804	**4AFU6**
AirHawk ll Air Mask, Advantage 4000 Facepiece, 30-minute carbon cylinder	10095806	**4AFU7**

Application: Any IDLH application which combines with high heat and flame applications such as petroleum refinery emergencies or steel mill high heat situations.

FireHawk® M7 Air Mask

The FireHawk M7 Air Mask is MSA's most advanced SCBA, and is designed as a modular platform exceeding new NFPA 2007 requirements, providing responders with the highest-quality SCBA currently available.

- Entire SCBA simplifies maintenance through parts reduction, all of which lower total ownership cost
- System is designed to accept future technology upgrades, as unit includes electronic components such as PASS alarms
- Electronics are virtually "bullet-proof" to provide superior impact and water ingress protection
- Uses Ultra Elite® Facepiece, providing exceptional visual and communication capabilities
- NIOSH- and NFPA 2007-edition approved

SCBA Accessories

Description	MSA Part #	Grainger Item #
FireHawk M7 Air Mask, Ultra Elite Facepiece, 30-minute aluminum cylinder	10095804	**4AFU6**
FireHawk M7 Air Mask, Ultra Elite Facepiece, 30-minute carbon-wrapped cylinder	10095806	**4AFU7**

Replacement Cylinders

Cylinder Description	Pressure	MSA Part #	Grainger Item #
Carbon-wrapped, 30-minute supply	2216 psig	807586	**2YRE5**
Aluminum, 30-minute cylinder	2216 psig	809872	**2YRE6**
Carbon-wrapped, 30-minute cylinder	4500 psig	807587	**2YRE7**
Carbon-wrapped, 60-minute cylinder	4500 psig	807588	**2YRE8**

Replacement Facepieces

Facepiece Description	Size	MSA Part #	Grainger Item #
Ultra Elite M7, Firehawk PTC Regulator	Small	10084690	**4AFU9**
Ultra Elite M7, Firehawk PTC Regulator	Medium	10084824	**4AFV1**
Ultra Elite M7, Firehawk PTC Regulator	Large	10084828	**4AFV2**

MSA *The Safety Company*

Occupational Health and Safety
Gas Detection Equipment for Air Monitoring Compliance

Issue: Workers in a variety of industries may encounter potentially hazardous gases every day in confined space atmospheres. ANSI Z117.1-2003 establishes the procedures, performance requirements, and minimum safety requirements for confined space operations.

Application: A confined space is defined by ANSI Z117.1-2003 as an enclosed area that is large enough and so configured that an employee can bodily enter and has the following characteristics: its primary function is something other than human occupancy AND has restricted entry and exit. Confined spaces represent potentially major health and safety risks for many employees. The ability to recognize and plan appropriately for confined space work can mean the difference between a job well done and disaster.

Recommendation: Grainger offers the MSA ALTAIR® 4X Multigas Detector to monitor for hazardous gases and oxygen deficiency. This monitoring equipment satisfies the safety requirements for confined space as defined by ANSI Z117.1-2003.

MSA

The Safety Company

ANSI (American National Standards Institute) Z117.1-2003 Safety Requirements for Confined Spaces:
Requirement 6.1.6

❶ **Instrument reliability verification:** Calibration of direct reading portable atmospheric testing instruments shall be conducted according to manufacturer recommendations as necessary to ensure accuracy; functional (bump) test should be performed prior to each day's use.

❷ **Continuous monitoring:** Continuous monitoring should be considered when workers are present in confined space atmospheric conditions that have the potential to change, such as broken/leaking pipes or vessels.

Confined space markets and applications:
Confined spaces exist in many sizes and shapes and can be found within these markets and others: heavy industry, food, chemical and petroleum processing, utility and communications installations, and construction sites.

The following areas are typically classified as confined spaces and should be treated with caution: storage tanks, pump wet wells, degreasers, sewers, manholes, tunnels, underground vaults, boilers, silos, vessels, grain elevators, mixers, open-topped water tanks, water towers, enclosures with bottom access, and railcar tanks.

Understanding gas detection bump tests and calibration:
To ensure accuracy of all monitoring and detection equipment, calibration should be performed regularly. To further clarify, the International Safety Equipment Association (ISEA) has issued a position statement on instrument calibration for use in confined spaces. According to this document, "a bump test or full calibration of direct-reading portable gas monitors should be made before each day's use in accordance with the manufacturer's instructions, using an appropriate test gas." If an instrument fails the bump test, it must be adjusted via full calibration before use.

• Proper, regular instrument calibration helps to prevent inaccurate gas concentration readings that could result in injury or even death of workers and other personnel.

GRAINGER®
FOR THE ONES WHO GET IT DONE

ALTAIR 4X Multigas Detector

Continuously monitors for oxygen deficiency or enrichment, presence of combustible gas, and presence of certain toxic gases (such as carbon monoxide and/or hydrogen sulfide), meeting ANSI requirements.

- MotionAlert™ feature signals "man down" plus audible (95+ dB), visual (bright LEDs), and vibrating alarms
- Unit is IP67-rated for unsurpassed dust and water resistance; withstands 20-ft drop test
- Exclusive MSA XCell® Sensors offer superior performance, reliability, and cost savings
- Large, easy-to-read display for confined space work
- Long-life battery lasts for 24+ hours
- Comprehensive three-year warranty, optional one-year extended warranty

All (UL-approved) kits below include data logging, charger, calibration cap and tubing, CD manual.

Description	MSA Part #	Grainger Item #
4-gas, charcoal: LEL, O_2, CO, H_2S	10107602	5EMR3
4-gas, phosphorescent: LEL, O_2, CO, H_2S	10107603	6RRA2
3-gas, charcoal: LEL, O_2, CO	10107604	5EMR4
3-gas, phosphorescent: LEL, O_2, CO	10110445	6RRA3
2-gas, charcoal: LEL, O_2	10107605	5EMR5
2-gas, phosphorescent: LEL, O_2	10110446	6RRA4
4-gas plus calibration kit and carrying case	10110488	6RRC0
4-gas plus calibration kit, carrying case, pump probe	10110489	6RRC1

ALTAIR 4 and 4X Calibration Equipment

Description	MSA Part #	Grainger Item #
Calibration Kit, Model RP	477149	1RG86
4-gas calibration gas cylinder, 34L	10048280	2TEY1

Galaxy® GX2 Automated Test System
- Ease of use; able to calibrate and test gas detectors effortlessly.
- Low cost of ownership; saves time, calibration gas and money.
- Proactive safety; command, control and configure to suite your needs.

Description	MSA Part #	Grainger Item #
Galaxy GX2 Test Stand, 1 Valve, Charging	10128630	TBD
Galaxy GX2 Electronic Cylinder Holder	10105756	TBD

ALTAIR 4 and 4X Accessories

Description	MSA Part #	Grainger Item #
Universal Pump Probe (UL)	10046528	2TEX4
Charger cradle assembly	10086639	2TEX5
Power supply	10087913	2TEX6
JetEye IR Adaptor (required to download data)	10082834	2TEY4

For more information contact your Grainger Representative.

MSA
The Safety Company

Occupational Health and Safety
Gas Detection Equipment for Air Monitoring Compliance

Issue: Workers in a variety of industries may encounter potentially hazardous gases every day in confined space atmospheres. ANSI Z117.1-2003 establishes procedures, performance requirements, and minimum safety requirements for confined space operations.

Application: A confined space is defined by ANSI Z117.1-2003 as an enclosed area that is large enough and so configured that an employee can bodily enter and has the following characteristics: its primary function is something other than human occupancy AND has restricted entry and exit. Confined spaces represent potentially major health and safety risks for many employees. The ability to recognize and plan appropriately for confined space work can mean the difference between a job well done and disaster.

Recommendation: Grainger offers the MSA ALTAIR® 5X Multigas Detector to monitor for hazardous gases and oxygen deficiency. This monitoring equipment satisfies safety requirements for confined space as defined by ANSI Z117.1-2003.

MSA
The Safety Company

ANSI (American National Standards Institute) Z117.1-2003 Safety Requirements for Confined Spaces

Requirement 6.1.6:

❶ **Instrument reliability verification:** Calibration of direct reading portable atmospheric testing instruments shall be conducted according to manufacturer recommendations as necessary to ensure accuracy; functional (bump) test should be performed prior to each day's use.

❷ **Continuous monitoring:** Continuous monitoring should be considered when workers are present in confined space atmospheric conditions that have the potential to change, such as broken/leaking pipes or vessels.

Confined space markets and applications:

Confined spaces exist in many sizes and shapes and can be found within these markets and others: heavy industry, food, chemical and petroleum processing, utility and communications installations, and construction sites.

The following areas are typically classified as confined spaces and should be treated with caution: storage tanks, pump wet wells, degreasers, sewers, manholes, tunnels, underground vaults, boilers, silos, vessels, grain elevators, mixers, open-topped water tanks, water towers, enclosures with bottom access, and railcar tanks.

Understanding gas detection bump tests and calibration:

To ensure accuracy of all monitoring and detection equipment, calibration should be performed regularly. To further clarify, the International Safety Equipment Association (ISEA) has issued a position statement on instrument calibration for use in confined spaces. According to this document, "a bump test or full calibration of direct-reading portable gas monitors should be made before each day's use in accordance with the manufacturer's instructions, using an appropriate test gas." If an instrument fails the bump test, it must be adjusted via full calibration before use.

- Proper, regular instrument calibration helps to prevent inaccurate gas concentration readings that could result in injury or even death of workers and other personnel.

Product Features

ALTAIR® 5X Multigas Detector

- Continuously monitors for oxygen deficiency or enrichment, the presence of combustible gas, and the presence of certain toxic gases (such as carbon monoxide and/or hydrogen sulfide), meeting ANSI requirements
- MotionAlert™ feature signals "man down", plus audible (95+ dB), visual (bright LEDs) and vibrating alarms
- InstantAlert™ feature offers manual activation of all alarms to alert others to potentially hazardous situations
- Unit is IP65-rated for unsurpassed dust and water resistance and can withstand a 10-foot drop test
- Internal pump for remote sampling such as for confined space entry
- Large, easy-to-read color display is useful when working in confined spaces
- Optional logo display screen customization
- Long-life battery lasts for 18+ hours
- Available 17-language display capability
- Comprehensive 3-year warranty

All (UL-approved) kits listed below include data logging feature, integral pump, rechargeable battery pack, charger, calibration cap, tubing, CD manual.

Description	MSA Part #	Grainger Item #
Economy Kits - monochrome display		
4-gas: LEL, O_2, CO, H_2S	10116924	6RPZ6
5-gas: LEL, O_2, CO, H_2S, SO_2	10116925	6RPZ7
Industrial Kits - monochrome display, 10-ft sampling line, 1-ft probe		
4-gas: LEL, O_2, CO, H_2S	10116926	6RPZ8
5-gas: LEL, O_2, CO, H_2S, SO_2	10116927	6RPZ9
Deluxe Kits - color display, 10-ft sampling line, 1-ft probe		
4-gas: LEL, O_2, CO, H_2S	10116928	6RRA0
5-gas: LEL, O_2, CO, H_2S, SO_2	10116929	6RRA1

Galaxy® Automated Test System

- Ease of use; able to calibrate and test gas detectors effortlessly.
- Low cost of ownership; saves time, calibration gas and money.
- Proactive safety; command, control and configure to suite your needs.

Description	MSA Part #	Grainger Item #
Galaxy GX2 Test Stand, 1 Valve, Charging	10128626	**TBD**
Galaxy GX2 Electronic Cylinder Holder	10105756	**TBD**

ALTAIR 5X Multigas Detector Calibration Equipment

Description	MSA Part #	Grainger Item #
Calibration kit, Model RP	477149	**1RG86**
4-gas calibration gas (LEL, O_2, CO, H_2S), 34L	10048280	**2TEY1**
SO_2 calibration gas, 34L	711070	**3FLV1**

ALTAIR 5X Multigas Detector Accessories

Description	MSA Part #	Grainger Item #
Power supply	10087913	**2TEX6**
JetEye IR Adaptor (required for data download)	10082834	**2TEY4**
Alkaline battery pack	10114837	**6RRA9**
Lithium-ion battery pack	10114835	**6RRA8**
Vehicle charger	10099397	**6RRA7**

ALTAIR 5X Multigas Detector Replacement Sensors

Description	MSA Part #	Grainger Item #
Combustible (LEL) sensor	10106722	**5ERK9**
Oxygen (O_2) sensor	10106729	**5ERL3**
Carbon monoxide (CO)/hydrogen sulfide (H_2S) sensor	10106725	**5ERL2**

For more information contact your Grainger Representative.

MSA
The Safety Company

Occupational Health and Safety
Gas Detection Solutions for OSHA Compliance

Issue: Many industrial workers encounter potentially hazardous gases every day within confined space environments. ANSI Z117.1-2003 establishes procedures, performance requirements, and minimum safety requirements for confined space operations.

Application: A confined space is defined by ANSI Z117.1-2003 as "an enclosed area that is large enough and so configured that an employee can bodily enter and has the following characteristics: its primary function is something other than human occupancy AND has restricted entry and exit." Confined spaces represent major potential health and safety risks for many employees. Appropriate recognition and planning for confined space work can mean the difference between a job well done and disaster.

Recommendation: Grainger offers the MSA gas detectors for monitoring of hazardous gases and oxygen deficiency. These models satisfy confined space safety requirements as defined by ANSI Z117.1-2003.

ANSI (American National Standards Institute) Z117.1-2003 Safety Requirements for Confined Spaces

Requirement 6.1.6:
Instrument reliability verification: calibration of direct-reading portable atmospheric testing instruments shall be conducted according to manufacturer recommendations, as necessary to help ensure accuracy, and functional (bump test) prior to each day's use.

Continuous monitoring should be considered in situations when a worker is present in a space where atmospheric conditions have the potential to change, for example broken or leaking pipes or vessels.

Confined Space Markets and Applications

Confined spaces of many sizes and shapes are typically found in heavy industry, food, chemical and petroleum processing, utility and communications installations, and construction sites.

The following areas are also typically classified as confined spaces and should be treated with caution: storage tanks, pump wet wells, degreasers, sewers, manholes, tunnels, underground vaults, boilers, silos, vessels, grain elevators, mixers, open-topped water tanks, water towers, enclosures with bottom access, and railcar tanks.

Understanding Gas Detection Bump Tests and Calibration

To help ensure the accuracy of all monitoring and detection equipment, calibration should be performed regularly. For clarification, the International Safety Equipment Association (ISEA) has issued an instrument calibration position statement concerning confined spaces.

According to this document, "*a bump test or full calibration of direct-reading portable gas monitors should be made before each day's use in accordance with the manufacturer's instructions, using an appropriate test gas.*" If an instrument fails the bump test, it must be adjusted via full calibration before use.

The primary reason for regular instrument calibration is to help prevent inaccurate gas concentration readings that could potentially lead to injury or even death of workers and other personnel.

Sirius® PID Multigas Detector

- Combination multigas detector with PID (photo-ionization detector) for situations where volatile organic compounds monitoring is required.
- Tremendous flexibility: one PID and four gases in one instrument provide detection of hundreds of chemicals.
- Loud, attention-grabbing alarms include piercing audible horn and multi-directional LED lights to alert users of alarm conditions.
- Easy calibration: simple one button calibration provides simplicity necessary for new users.

Description	MSA Part #	Grainger Item #
Deluxe LEL 4-gas lithium ion PID, calibration kit, lamp cleaning kit, data log	10052511	**1TBB7**
Lamp Cleaning Kit	10049691	**1TBC6**
Replacement lamp	10049692	**1TBC5**
Calibration gas 34L: isobutylene	10048279	**2TEY3**
Calibration gas 34L: LEL, O_2, CO, H_2S	10048280	**2TEY1**
Calibration Kit, Model RP	477149	**1RG86**

ALTAIR® and ALTAIR Pro Single Gas Detectors

- Both models can continuously monitor for a single gas; carbon monoxide, hydrogen sulfide, and oxygen.
- Both models offer a triple-alarm system featuring bright flashing LEDs, piercing audible alarm, and vibrating alarm to help ensure that no alarm condition goes unnoticed.
- Both models are extremely resistant to drops and impacts and are rated to IP67 protection levels for dust and water ingress.
- Both models feature simple one-button operation and two-year warranty.
- ALTAIR **Single-Gas Detector** will operate for over two years maintenance free. Unit is always on once activated.
- ALTAIR Pro **Single-Gas Detector** uses replaceable batteries and sensors and features large backlit display.

Description	MSA Part #	Grainger Item #
ALTAIR Detector hydrogen sulfide	10070749	**2YA40**
ALTAIR Detector oxygen	10070791	**2YA41**
ALTAIR Detector carbon monoxide	10070750	**2YA39**

Description	MSA Part #	Grainger Item #
ALTAIR Pro Detector hydrogen sulfide	10074136	**1HLB8**
ALTAIR Pro Detector oxygen	10074137	**1HLB9**
ALTAIR Pro Detector carbon monoxide	10074135	**1HLB7**
ALTAIR Pro Detector chlorine	10076716	**2TEY6**
ALTAIR Pro Detector ammonia	10076730	**2TEY5**
ALTAIR Pro Detector chlorine dioxide	10076717	**2TEY7**
ALTAIR Pro Detector nitrogen dioxide	10076731	**2TEY8**
ALTAIR Pro Detector oxygen remote	10076733	**2TEY9**
ALTAIR Pro Detector sulfur dioxide	10076736	**5EMP4**
ALTAIR Pro Detector phosphine	10076735	**5EMP5**

Calibration Equipment

Description	MSA Part #	Grainger Item #
Calibration gas 34L: H_2S	711062	**2YA43**
Calibration gas 34L: CO	710882	**2YA42**
Calibration Kit, Model RP	477149	**1RG86**

To order other calibration gas cylinders, contact MSA or Grainger Sourcing.

For more information contact your Grainger Representative.

MSA
The Safety Company

Occupational Health and Safety
Gas Detection Selection Guide for OSHA Compliance

Issue: Workers in many industries may encounter potentially hazardous gases in confined space environments every day. Appropriate portable gas detection instruments are used to monitor confined space atmospheres.

Application: Multigas and single-gas detectors are used to monitor immediate hazardous gas environments.

Recommendation: Grainger offers reliable and easy-to-use gas detection instruments to monitor for hazardous gases and oxygen deficiency commonly found within confined space applications.

MSA

The Safety Company

Four Common Gas Hazard Types:

Type of Monitoring	The Purpose	The Hazard	Possible Source of Hazard
Personal protection	Worker safety	Toxic gases	Leaks, fugitive emissions, industrial process defects
Explosive	Worker and facility safety	Explosions	Presence of combustible gases/vapors due to leaks, industrial process defects
Environmental	Environmental safety	Environmental degradation	Oil leaks into sewers or lakes, acid gas emissions
Industrial process	Process control	Process malfunction	Possible fault or other process error

Recommended Gas Detection Solutions

ALTAIR® 4X Multigas Detector
• Personal protection
• Potentially explosive atmosphere monitoring

ALTAIR 5X Multigas Detector
• Potentially explosive atmosphere and environmental monitoring

Sirius® PID Multigas Detector
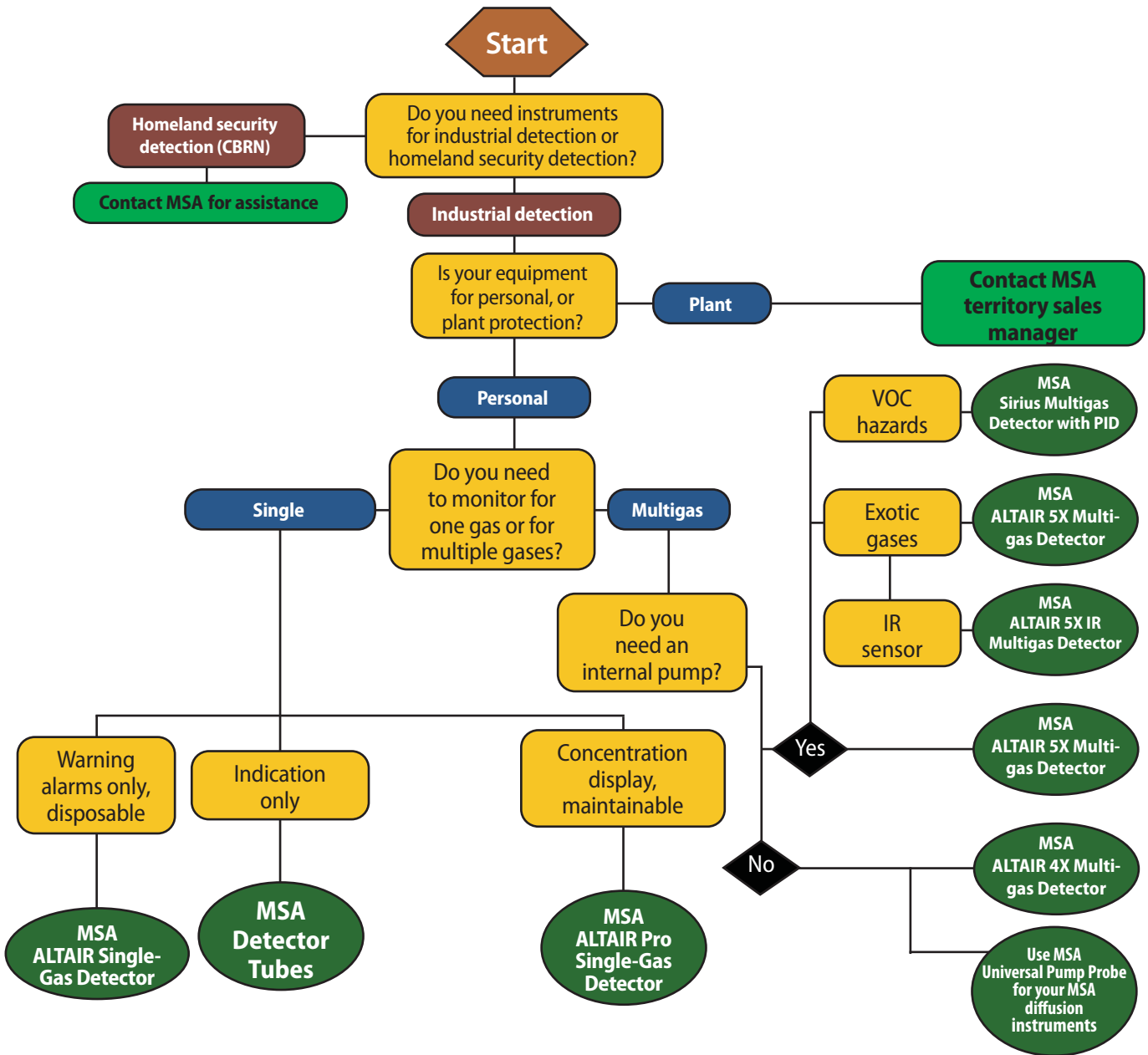• Potentially explosive atmosphere and environmental monitoring

ALTAIR Single-Gas Detector
• Personal protection
• Potentially explosive atmosphere monitoring

ALTAIR Pro Single-Gas Detector
• Personal protection
• Potentially explosive atmosphere monitoring

Portable Gas Detection Selection Quick Guide

Start

Do you need instruments for industrial detection or homeland security detection?

Homeland security detection (CBRN)

Contact MSA for assistance

Industrial detection

Is your equipment for personal, or plant protection?

Plant

Contact MSA territory sales manager

Personal

Do you need to monitor for one gas or for multiple gases?

Single

Multigas

Do you need an internal pump?

VOC hazards → **MSA Sirius Multigas Detector with PID**

Exotic gases → **MSA ALTAIR 5X Multi-gas Detector**

IR sensor → **MSA ALTAIR 5X IR Multigas Detector**

Yes → **MSA ALTAIR 5X Multi-gas Detector**

No → **MSA ALTAIR 4X Multi-gas Detector**

Use MSA Universal Pump Probe for your MSA diffusion instruments

Warning alarms only, disposable → **MSA ALTAIR Single-Gas Detector**

Indication only → **MSA Detector Tubes**

Concentration display, maintainable → **MSA ALTAIR Pro Single-Gas Detector**

For assistance, please contact MSA Customer Service at 800.672.2222 or your local MSA territory sales manager.
Find your local MSA territory sales manager at www.msanorthamerica.com, then "Sales Manager Locator".

For more information contact your Grainger Representative.

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Occupational Health and Safety
Fall Arrest Products for OSHA Compliance

Issue: When implementing an engineering control to a fall protection hazard is not feasible, a fall arrest system must be implemented. A complete fall arrest system must be provided to employees for employers to be OSHA-compliant.

Application: Specifically, OSHA outlines a fall arrest system to include an anchorage or **tie-off** point, a body harness and a connecting device. This product should meet OSHA requirements and be ANSI-compliant.

Recommendation: MSA offers a complete line of fall protection products through Grainger to provide customers the tools to be OSHA-compliant. In addition, MSA offers services such as product training and compliance support to better understand fall protection program requirements.

The Safety Company

Components of a Comprehensive Fall Arrest System:

When engineering control is not feasible, a fall arrest system must be implemented.

- A fall arrest system is designed to limit injury in the event of a fall.

Three components of a fall arrest system:

- A: Anchorage or tie-off point. Anchorage means a secure attachment point for connecting devices.
- B: Body harness. Body harness includes straps to distribute fall arrest forces over thighs, pelvis, waist, chest, and shoulders; is also a means for attaching a connecting device.
- C: Connecting device (lanyard/locking snaphook); includes lanyard with snaphook that allows each end to connect body harness to an anchorage point.

OSHA 29 CFR 1926.502 requires that a personal fall arrest system requires (but is not limited to):

- Limit maximum arresting force on employee to 1,800 lbs.
- Be rigged such that employee can neither free-fall more than 6' (1.8 m), nor contact any lower level.
- Bring worker to a complete stop and limit maximum deceleration distance an employee travels to 3.5'.
- Body belts are not acceptable as part of a personal fall arrest system.

ANSI Z359 standard for Personal Fall Arrest
- ANSI Z359.0-2007: Definitions
- ANSI Z359.1-2007: Fall arrest systems, subsystems and components
  - For a lanyard, the snaphook and carabiner gate strength will increase to 3,600 pounds.
  - Twin-leg fall arrest lanyards will be tested to 5,000 pounds at the junction point where the lanyard legs come together.
- ANSI Z359.2-2007: Minimum requirements for a comprehensive, managed fall protection program
- ANSI Z359.3-2007: Work positioning and travel restriction systems, subsystems and components
- ANSI Z359.4-2007: Assisted-rescue and self-rescue systems, subsystems and components

Fall Protection Solutions

Workman® Full Body Harness
The Workman Full Body Harness provides comfortable protection using lightweight components and durable webbing.
- Abrasion-resistant, strong, durable webbing harness for easy donning and adjustment.
- Comfortable yellow polyester webbing for increased visibility.
- Web retainer collars keep excess webbing neat and include integral load indicator.

Size	Style	Description	MSA Part #	Grainger Item #
Standard	Vest-type	Chest/Qwik-Fit™ Leg Buckle, back D-ring	10072479	3PUC5
X-Large	Vest-type	Chest/Qwik-Fit Leg Buckle, back D-ring	10072480	3PUC6
Standard	Vest-type	Chest/tongue leg buckle, back D-ring	10072487	3PUC3
X-Large	Vest-type	Chest/tongue leg buckle, back D-ring	10072488	3PUC4
Standard	Vest-type	Chest/tongue leg buckle, back/hip D-ring	10072491	3PUC1
X-Large	Vest-type	Chest/tongue leg buckle, back/hip D-ring	10072492	3PUC2

(Meets all applicable OSHA regulations, ANSI Z359.1-2007 and A10.32 standards, certified to CSA Z259.10-06.)

Workman Construction Full Body Harness
Workman Full Body Harness provides many features for comfortable, long-term wear.
- Features integral back pad and tool belt plus shoulder pads.

Size	Style	Description	MSA Part #	Grainger Item #
Standard	Vest-type	Chest Qwik-Fit Buckle, leg tongue buckle, back/hip D-ring	10077571	23Z792
X-Large	Vest-type	Chest Qwik-Fit Buckle, leg tongue buckle, back/hip D-ring	10077572	23Z793

(Meets all applicable OSHA regulations, ANSI Z359.1-2007 and A10.32 standards, certified to CSA Z259.10-06.)

Workman Shock-Absorbing Lanyards
Workman Shock-Absorbing Lanyards are lightweight with a low-profile body. Shock absorber includes clear, durable protective label cover to increase service life and allow for easy inspection.

Description	Connection	MSA Part #	Grainger Item #
Single-leg/tie-back	LC	10072472	3WNJ5
Twin-leg/tie-back	LC	10072473	3WNH6
Single-leg	LC	10072474	3WNJ3
Twin-leg	LC	10073708	3WNL2
Single-leg	GL3100	10076124	23Z802

(Meets OSHA regulations and CSA Z259.11-05 E4.)

For more information contact your Grainger Representative.

MSA The Safety Company

TechnaCurv® Full Body Harness

TechnaCurv Full Body Harness provides many features for comfortable long-term wear.
- Features Curvilinear Comfort System to curve webbing around the neck area to prevent chaffing and discomfort.
- Harness webbing is soft and flexible to move with you as you work.

Size	Style	Description	MSA Part #	Grainger Item #
Standard	Vest-type	Chest/Qwik-Fit Leg Buckle, back D-ring	10041517	**3NGJ3**
Standard	Pullover	Qwik-Fit Leg Buckle, back D-Ring	10041518	**3NGJ5**
X-large	Vest-type	Chest/Qwik-Fit Leg Buckle, back D-ring	10041519	**3NGJ4**
X-large	Pullover	Qwik-Fit Leg Buckle, back D-ring	10041590	**3NGJ6**
Standard	Vest-type	Chest/tongue leg buckle, back D-ring	10041591	**3NGJ7**
X-large	Vest-type	Chest/tongue leg buckle, back D-ring	10041592	**3NGJ8**
Standard	Vest-type	Chest Qwik-Fit Buckle, tongue leg buckle, back/hip D-ring	10041595	**23Z778**
X-large	Vest-type	Chest Qwik-Fit Buckle, tongue leg buckle, back/hip D-ring	10041596	**23Z779**
Standard	Vest-type	Chest Qwik-Fit Buckle, tongue leg buckle, back D-ring, shoulder pad	10041599	**23Z780**
X-large	Vest-type	Chest Qwik-Fit Buckle, tongue leg buckle, back D-ring, shoulder pad	10041600	**23Z781**
Standard	Vest-type	Chest Qwik-Fit Buckle, tongue leg buckle, back/hip/chest D-ring	10041607	**23Z782**
X-large	Vest-type	Chest Qwik-Fit Buckle, tongue leg buckle, back/hip/chest D-ring	10041608	**23Z783**
Standard	Pullover	Tongue leg buckle, back/hip/chest D-ring	10041609	**23Z784**
X-large	Pullover	Tongue leg buckle, back/hip/chest D-ring	10041610	**23Z785**
Standard	Vest-type	Chest Qwik-Fit Buckle, Secur-Fit™ Buckle, back/hip/chest D-ring, shoulder/sub-pelvic pad	10041615	**23Z786**
X-large	Vest-type	Chest Qwik-Fit Buckle, Secur-Fit Leg Buckle, back/hip/chest D-ring, shoulder/sub-pelvic pad	10041616	**23Z787**

(Meets all applicable OSHA regulations, ANSI Z359.1-2007 and A10.32 standards, certified to CSA Z259.10-06.)

TechnaCurv® Construction Full Body Harness

TechnaCurv Full Body Harness provides many features for comfortable long-term wear.
- Includes integral belt and back pad for superior comfort, plus belt loops for flexibility to add the belt of your choice.

Size	Style	Description	MSA Part #	Grainger Item #
Standard	Vest-type	Chest Qwik-Fit Buckle, leg tongue buckle, back/hip D-ring	10054402	**23Z788**
Standard	Vest-type	Chest Secur-Fit Buckle, leg tongue buckle, back/hip D-ring	10054403	**23Z789**

(Meets all applicable OSHA regulations, ANSI Z359.1-2007 and A10.32 standards, certified to CSA Z259.10-06.)

TechnaCurv Tower Full Body Harness

- Designed with integral body belt and removable saddle for ultimate comfort during prolonged work positioning and suspension activities.

Size	Style	Description	MSA Part #	Grainger Item #
Standard	Vest-type	Leg Secur-Fit Buckle, back/hip D-ring, Shoulder/Sub-Pelvic Pads	10048344	**23Z790**
X-large	Vest-type	Leg Secur-Fit Buckle, back/hip D-ring, shoulder/sub-pelvic pads	10048345	**23Z791**

(Meets all applicable OSHA regulations, ANSI Z359.1-2007 and A10.32 standards, certified to CSA Z259.10-06.)

GRAINGER®
FOR THE ONES WHO GET IT DONE

EVOTECH® Full Body Harness

EVOTECH Full Body Harness improves user comfort, ease of use and durability.
- Comfortable, breathable padding with moisture-wicking material keeps users cooler.
- NanoSphere coating on webbing repels dirt, grease and other contaminants.
- RFID chip provides easy tracking and product inspection.

Size	Style	Description	MSA Part #	Grainger Item #
Standard	Vest-type	Chest Quick-Connect Buckle, leg tongue buckle, back D-ring	10105931	**23Z768**
X-large	Vest-type	Chest Quick-Connect Buckle, leg tongue buckle, back D-ring	10105932	**23Z769**
Standard	Vest-type	Chest Quick-Connect Buckle, leg tongue buckle, back/hip D-ring	10105933	**23Z770**
X-large	Vest-type	Chest Quick-Connect Buckle, leg tongue buckle, back/hip D-ring	10105935	**23Z771**
Standard	Vest-type	Chest/Leg Quick-Connect Buckle, back D-ring	10105940	**23Z772**
X-large	Vest-type	Chest/Leg Quick-Connect Buckle, back D-ring	10105941	**23Z773**
Standard	Vest-type	Chest/Leg Quick-Connect Buckle, back/hip D-ring	10105942	**23Z774**
X-large	Vest-type	Chest/Leg Quick-Connect Buckle, back/hip D-ring	10105943	**23Z775**
Standard	Vest-type	Chest Qwik-Fit Buckle, leg tongue buckle, back D-ring	10105956	**23Z776**
X-large	Vest-type	Chest Qwik-Fit Buckle, leg tongue buckle, back D-ring	10105957	**23Z777**

(Meets all applicable OSHA regulations, ANSI Z359.1-2007 and A10.32 standards, certified to CSA Z259.10-06.)

Snaphooks

| LC snaphook | GL 3100 snaphook | 36C snaphook | 36CL snaphook | LS snaphook | HL64 snaphook | LS swivel snaphook |

MSA
The Safety Company

ArcSafe® Full Body Harness

ArcSafeFull Body Harness is SEI-certified to ASTM F887-05 requirements for arc flash protection up to 40 cal/cm2.

- Nylon web loop attachment points and integral load indicator

Size	Style	Description	MSA Part #	Grainger Item #
Standard	Vest-type	Leg tongue buckle, hip/front/back attachments	10070423	**23Z794**
X-large	Vest-type	Leg tongue buckle, hip/front/back attachments	10070424	**23Z795**
Standard	Vest-type	Leg Qwik-Fit Buckle, hip/front/back attachments	10070439	**23Z796**
X-large	Vest-type	Leg Qwik-Fit Buckle, hip/front/back attachments	10070440	**23Z797**
Standard	Pullover	Leg tongue buckle, hip/front/back attachments	10070463	**23Z798**
X-large	Pullover	Leg tongue buckle, hip/front/back attachments	10070464	**23Z799**

(Meets all applicable OSHA regulations, ANSI Z359.1-2007 and A10.32 standards, certified to CSA Z259.10-06.)

ArcSafe Shock-Absorbing Lanyards

- ArcSafe Lanyards are SEI-certified to ASTM F887-05 arc flash protection requirements.

Description	Connection	MSA Part #	Grainger Item #
Single-leg	Hitch loop/36C	10060139	**23Z803**
Twin-leg	Hitch loop/36C	10060140	**23Z804**
Twin-leg	Hitch loop/36CL	10088256	**23Z805**

(CSA Z259.11-05 E4)

Shock-Absorbing Lanyards

FP5K™ Tie-Back Shock-Absorbing Lanyards
- Web version employs Monster-Edge webbing with 12,000-lb minimum breaking strength and increased abrasion resistance.

Description	Type	MSA Part #	Grainger Item #
Single-leg	Adjustable, web	10047084**	23Z806
Twin-leg	Adjustable, web	10047085**	23Z807
Single-leg	Fixed, cable	10047086**	23Z808
Twin-leg	Fixed, cable	10047087**	23Z809
Single-leg	Adjustable, web	10105190*	23Z810

(*ANSI Z359.13-2007, **CSA Z259.11-05 E4)

Diamond Shock-Absorbing Lanyards
- Elastic design reduces trip and snag hazards (6' lanyard contracts to 4.5').
- Teflon-coated, durable polyester sheath for increased abrasion and UV resistance.

Description	Connection	MSA Part #	Grainger Item #
Single-leg	LS/HL64	10023933**	23Z811
Twin-leg	Swivel LS/HL64	10023971**	23Z812
Single-leg	36C/36C	10088065*	23Z813
Single-leg	36C/36CL	10088066*	23Z814
Twin-leg	36C/36C	10088069*	23Z815
Twin-leg	36C/36CL	10088070*	23Z816
Twin-leg	36C/36CL, D-ring extension	10088077*	23Z817

(*ANSI Z359.13-2007, **CSA Z259.11-05 E4)

Thermatek® Shock-Absorbing Lanyards
- Thermatek Lanyards for high-heat applications offer Tuffweld protective shock-absorber cover.

Description	Connection	MSA Part #	Grainger Item #
Single-leg	36C/36C	10088246*	23Z818
Single-leg, 12' free-fall	36C/36C	10088247*	23Z819
Twin-leg	36C/36C	10088250*	23Z820
Single-leg	LS/LS	10027104**	23Z821
Single-leg	LS/LS	10023485**	23Z822
Single-leg, 12' free-fall	LS/LS	10026048**	23Z823

(*ANSI Z359.13-2007, **CSA Z259.11-05 E4)

For more information contact your Grainger Representative.

Restraint Lanyards and Anchorage Connectors

Web Restraint Lanyards
- Restraint lanyards are used primarily for travel restriction and work positioning applications.

Description	Connection	MSA Part #	Grainger Item #
Single-leg, 5'	FP5K/LS	10056762	23Z824
Single-leg, 6'	36C/36C	10089345	23Z825
Single-leg, 6'	Loop/36C	10089347	23Z826
Rebar chain assembly, 36CL snaphook with 2.25" (57mm) gate		10107326	23Z827
Rebar web assembly, 13" legs with large sliding snaphook		10072498	23Z828

Anchorage Connectors
PointGuard™ Anchorage Connector provides secure attachment point for residential and concrete construction applications.

Description	MSA Part #	Grainger Item #
PointGuard Anchorage Connector strap, residential version, 3' with D-ring	10042792	23Z829
PointGuard Anchorage Connector strap, concrete version, 4' with D-ring	10042794	23Z830

Durable anchorage strap includes D-ring on one end and loop on other end.

Description	MSA Part #	Grainger Item #
Anchorage connector strap, nylon, 5'	505282	23Z831
Anchorage connector strap, double D-ring, 3'	SFP2267503	23Z832
Anchorage connector strap, double D-ring, 4'	SFP2267504	23Z833
Anchorage connector strap, double D-ring, 6'	SFP2267506	23Z834

Designed as 1" nylon tube webbing sewn into endless loop. Can be hitched to anchorage point using various configurations.

Description	MSA Part #	Grainger Item #
Anchorage cable sling, 6'	SFP3267506	23Z835
Suretyman™ Anchorage Sling, 2'	SFP2267402	23Z836
Suretyman Anchorage Sling, 4'	SFP2267404	23Z837
Suretyman Anchorage Sling, 6'	SFP2267406	23Z838

Anchorage Connectors

FP Stryder™ Anchorage Connectors are easy to adjust with single-hand installation.

Description	MSA Part #	Grainger Item #
FP Stryder Connectors, standard, adjusts 4" to 14"	10051455	**23Z839**
FP Stryder Connectors, X-large, adjusts 14" to 24"	10051456	**23Z840**
FP Stryder Connectors Kit, standard version with X-large bar, carrying case	10051457	**23Z841**

Provides horizontal mobility, keeps anchorage connector directly overhead. Sizing to fit all beams.

Description	MSA Part #	Grainger Item #
BeamGlide™ Trolley, removable	506266	**23Z842**
BeamGlide Trolley, permanent	506252	**23Z843**
BeamGlide Trolley end-stops (pair)	506379	**23Z844**

All steel construction; fits all pitches of roof trusses or rafters.

Description	MSA Part #	Grainger Item #
Roof anchor, permanent, 2" x 4"	10016468	**23Z845**
Roof anchor, temporary, 3 per pack	416068	**23Z846**
Roof anchor, reusable	10102686	**23Z849**

Provide permanent anchorage point and bolts to beams or columns.

Description	MSA Part #	Grainger Item #
D-ring, single-bolt hole	10003213	**23Z847**
D-ring, single-bolt hole	10062597	**23Z848**

Quickly and easily removed and reinstalled in another location. Compact and lightweight durable stainless steel and aluminum construction.

Description	MSA Part #	Grainger Item #
Concrete anchor, 5K lbs	10081594	**23Z850**
Concrete anchor, 10K lbs	10081570	**23Z851**
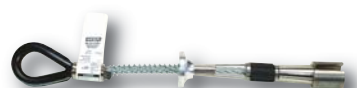
Provides fall protection during horizontal movement on railway bridges. Quick and easy installation.

Description	MSA Part #	Grainger Item #
Rail Slider™ Anchorage Connector for 80-136# rail	SFPRS6000	**23Z852**
Rail Slider Anchorage Connector for 141# rail	10030608	**23Z853**

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For more information contact your Grainger Representative.

Fall Protection Kits

Workman Fall Protection Kits
- Simple kits for construction and general maintenance applications.

Harness	Accessories	MSA Part #	Grainger Item #
Vest-style, standard size, Qwik-Fit Leg Buckle	Single-leg lanyard, anchor strap, duffel bag	10092166	23Z867
Vest-style, X-large size, Qwik-Fit Leg Buckle	Single-leg lanyard, anchor strap, duffel bag	10092168	23Z868

Workman Aerial Lift Fall Protection Kits
- Comprehensive kit is designed for use with aerial lift applications.

Harness	Accessories	MSA Part #	Grainger Item #
Vest-style, standard size, Qwik-Fit Leg Buckle	Single-leg lanyard, duffel bag	10092170	23Z863
Vest-style, X-large size, Qwik-Fit Leg Buckle	Single-leg lanyard, duffel bag	10092192	23Z865
Vest-style, standard size, tongue-buckle leg	Single-leg lanyard, duffel bag	10092191	23Z864
Vest-style, X-large size, tongue-buckle leg	Single-leg lanyard, duffel bag	10092193	23Z866

Workman Roofers' Fall Protection Kits
- Comprehensive kit was created for roofing fall protection.

Harness	Accessories	MSA Part #	Grainger Item #
Vest-style, standard size, Qwik-Fit Leg Buckle	25' rope, trailing rope grab, roof anchor, bucket	10074475	23Z869
Vest-style, standard size, tongue-buckle leg	25' rope, trailing rope grab, roof anchor, bucket	10074477	23Z870
Vest-style, standard size, Qwik-Fit Leg Buckle	25' rope, manual rope grab, bag	10074480	23Z871
Vest-style, standard size, tongue-buckle leg	25' rope, manual rope grab, bag	10092959	23Z872
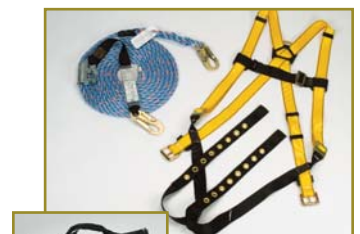
Thermatek® Harness Fall Protection Kits
- Thermatek Harness offers Kevlar/Nomex blend webbing for resistance to chemicals, weld splatter and other high heat exposures.
- Thermatek Shock-Absorbing Lanyard features burn-resistant Tuffweld protective cover (superior to Nomex).

Harness	Accessories	MSA Part #	Grainger Item #
Vest-style, standard size, Qwik-Fit Leg Buckle, back/hip D-rings	Single-leg 6' lanyard, HL2000 Snaphook, anchorage connector, duffel bag	10026061	**23Z859**
Vest-style, standard size, Qwik-Fit Leg Buckle, back/hip D-rings	Single-leg 6' lanyard, RL20 Snaphook, anchorage connector, duffel bag	10026063	**23Z861**
Vest-style, standard size, Qwik-Fit Leg Buckle, back/hip D-rings	Single-leg 12' lanyard, HL2000 Snaphook, anchorage connector, duffel bag	10026062	**23Z860**
Vest-style, standard size, Qwik-Fit Leg Buckle, back/hip D-rings	Single-leg 12' lanyard, RL20 Snaphook, anchorage connector, duffel bag	10026064	**23Z862**

(Meets OSHA, ANSI A10.32)

Carabiners
All carabiners have minimum breaking strength of 5,000 lbs and meet applicable OSHA regulations.

Description	MSA Part #	Grainger Item #
Steel, 9/16" (14 mm), 3600 lb gate	10089205	**23Z854**
Steel, 1" (25 mm), 3600 lb gate	10089207	**23Z855**
Steel, 2.1" (53 mm), 3600 lb gate	10089209	**23Z856**
Aluminum, 1" (25 mm)	SRCA853	**23Z857**
Aluminum, 2.1" (52 mm)	SRCA722	**23Z858**

10089205	10089207	10089209	SRCA853	SRCA722

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Fall Protection PFLs and SRLs

Workman PFL Lanyards
- With solid design and fast-acting brake mechanism, you can be confident that the Workman Personal Fall Limiter (PFL) will be there for you when you need it most.
- Durable, engineered thermoplastic housing for decreased weight.
- Rugged, impact-absorbing protective bumpers for added durability.
- Integral load indicator to alert user that unit has been involved in a fall.

Single-leg PFL Lanyards

Description	Connection	MSA Part #	Grainger Item #
10' web line	1" carabiner/LC	10093357	23Z877
12' cable line	1" carabiner/36C	10104793	23Z878
10' web line	1" carabiner/LC	10104797	23Z879
30' galvanized cable	36CS	10119507	23Z896
30' stainless steel cable	36CS	10120724	23Z897

Twin-leg PFL Lanyards
- System features easiest harness connection on the market; simply insert back D-ring into slot— you're connected and ready to work.
- Compact, lightweight design with robust thermoplastic housing.

Description	Connection	MSA Part #	Grainger Item #
6' web line	36CL	10118937	23Z880
6' web line	AL59	10120050	23Z881
6' web line	LC	10120051	23Z882
6' web line	36C	10120052	23Z883

Dyna-Lock® SRL Lanyards
- Dyna-Lock Self-Retracting Lanyards (SRL) are fast-acting fall arresters that limit free-fall distance, deceleration distance and fall arrest forces while allowing user freedom of movement.
- Dyna-Lock SRL is ideal for climbing applications where vertical mobility is needed.

Description	Length	MSA Part #	Grainger Item #
Galvanized wire rope	30' (10 m)	506202	23Z884
Galvanized wire rope	50' (16 m)	506204	23Z885
Galvanized wire rope	95' (30 m)	506208	23Z886
Nylon web	20' (6 m)	506615	23Z887
Galvanized wire rope	20' (6 m)	10017931	23Z888
Galvanized wire rope	30' (10 m)	10006470	23Z889
Galvanized wire rope	50' (16 m)	10006468	23Z890
Galvanized wire rope	95' (30 m)	10006464	23Z891
Nylon web	20' (6 m)	10006447	23Z892
Stainless steel cable	20' (6 m)	10017933	23Z893

(Meets all OSHA requirements and ANSI A10.32 standards.)

GRAINGER®
FOR THE ONES WHO GET IT DONE

Confined Space Equipment
- Simple setup procedure hastens process, promotes correct usage.
- Lynx® Rescuer allows for non-entry rescue of confined space entrant.
- Lynx Hoist provides lifting, lowering and positioning of personnel and materials.
- System can be used for leading edge work, maintenance and entry/retrieval from manholes, tank cars, silos, tanks, vaults, pits, vats, and other confined space applications.

Description	MSA Part #	Grainger Item #
Entry kit with tripod, Lynx Hoist and Rescuer, carry bag	10105271	**23Z894**
Entry kit with tripod, Lynx Rescuer, carry bag	10117244	**23Z895**
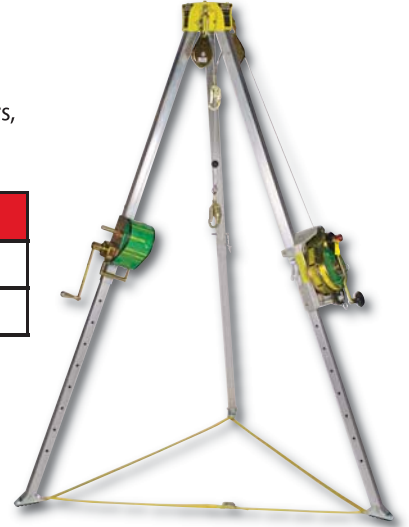
Temporary Horizontal Lifelines
- Designed for easy installation and removal. System can be mounted to any suitable 5,000 lb-rated anchorage.
- Highly visible 12-strand red rope will not buckle and minimizes fall distance due to low stretch properties.
- Includes integral energy absorber, 5/8" black nylon kernmantle rope, two cable anchor slings, storage bag.

Description	MSA Part #	Grainger Item #
Horizontal lifeline for two workers, 30' rope	10013152	**23Z873**
Horizontal lifeline for two workers, 60' rope	10013153	**23Z874**
Horizontal lifeline for two workers, 100' rope	10019085	**23Z875**
Horizontal lifeline for two workers, 200' rope	10022827	**23Z876**

(Meets all OSHA requirements and ANSI A10.32 standards.)

For more information contact your Grainger Representative.

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Occupational Health and Safety
Public Safety Products

Issue: Law enforcement, security, military, and other similar personnel operate in potentially hazardous environments where ballistic head protection, hearing protection, and respiratory protection is necessary to help keep them safe. Included are threats to the head from ballistic, i.e. firearm weapons, high noise environments from loud impulsive sounds, and respiratory protection from potential CBRN threats.

Application: Law enforcement personnel (police, SWAT, and sheriffs' departments), campus security personnel (colleges, universities, industry, and corporations), corrections department officers (DOCs), U.S. embassy security, first responders, and military personnel depend upon ballistic helmet protection. They also require the use of protective products such as high-noise hearing protection muffs and respiratory protection with CBRN gas masks.

Recommendation: Grainger offers MSA's market-leading products for head, hearing, and respiratory protection. These innovative and often patented products offer uncompromised protection with maximum comfort for use in potentially hazardous environments.

Millennium® Chemical-Biological Masks

Millennium Chemical-Biological Masks combine high performance, customized fit, comfort, and cost efficiency. CBRN canisters provide protection from chemical, biological, radiological, and nuclear contaminants. NIOSH-approved.
- Dual-canister mount allows for weapon sighting from either shoulder
- Standard mechanical speaking diaphragm
- Wide field of vision
- Integral drinking tube

The ESP® II Communication System is designed for use with Millennium Masks. This compact battery-operated unit clearly amplifies and projects the voice, allowing speech to be heard clearly even in high-noise areas. The unit clips onto the respirator facepiece diaphragm housing.

Description	MSA Part #	Grainger Item #
Millennium, small	10051286	**4DA79**
Millennium, medium	10051287	**4DA80**
Millennium, large	10051288	**4DA81**
CBRN canister	10046570	**4DA82**
ESP II Communication System	10026265	**4DA83**

Product Features

Supreme Pro™ Hearing Protection integrates with ballistic helmets to provide unobtrusive communication and hearing protection in areas of loud impulsive sounds, such as areas where weapons may be fired. This system protects your hearing while enabling clear radio communications.

- Cup-mounted microphones enhance user situational awareness, providing hearing protection while allowing users to hear ambient environmental sounds
- Communication system operates as either as a stand-alone headset, with the ACH, or with a gas mask

Description	MSA Part #	Grainger Item #
Supreme Pro, headband, boom mic right, NRR 18	10079965	**3THH5**
Supreme Pro, headband, boom mic left, NRR 18	10079964	**3THH6**
Supreme Pro, neckband, boom mic right, NRR 19	10079962	**3THH7**
Supreme Pro, neckband, boom mic left, NRR 19	10079967	**3THH8**

Radio Connectors and Accessories

Description	MSA Part #	Grainger Item #
Radio connector, Motorola SABER	10079684	**3THJ6**
Radio connector, Motorola HT1000, JT1000, MT2000, many others	10078232	**3THJ4**
Radio connector, Motorola HT750, Pro7150, GP329, many others	10077885	**3THJ5**
Finger PTT (push-to-talk)	10083177	**3THJ2**
Hygiene kit (cushions and inserts)	10061294	**3THJ3**

Supreme Pro-X and Supreme Pro Hearing Protection offer high amplification with natural realistic sounds, AUX input, fully waterproof microphones (Supreme Pro-X Muff only), and battery compartments.

Description	MSA Part #	Grainger Item #
Supreme Pro X, neckband, NRR 19	10082166	**3THH9**
Supreme Pro, headband, NRR 18	10061285	**3THJ1**

For more information contact your Grainger Representative.

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Grainger Item #	MSA Part#
10D939	10061127
10D940	815565
10D941	91589
10D942	91590
10D943	91584
10D944	82769
10E656	466356
10E657	492567
10E658	492566
10E659	10034022
10E660	10034023
10E661	10074820
10X301	10119576
10X302	10119575
10X303	10119574
10X304	10083786
10X305	10083782
10X306	10083790
10X307	10095743
10X308	10095745
10X309	697444
12V755	10115730
12V756	10121266
12V757	10115821
12V758	10121267
12V759	10115822
12V760	10121268
12V761	10116539
12V762	10116557
12V763	10116558
12V764	10117750
12V765	10117781
12V766	10117782
12V767	10117783
12V768	10118094
12V769	10115827
12V770	10115828
12V771	10115855
1AVR6	10026398
1AVR7	816645
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1AVT3	10063107
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1DKR6	10064644
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1DKR8	10008292
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1FC38	10036174
1HLB7	10074135
1HLB8	10074136
1HLB9	10074137
1MBH8	10059903
1MBH9	10067469
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1MBJ3	10031343
1MBJ4	10031342
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1MDV9	10034019
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1MDW4	10074819
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1TBC5	10049692
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20V802	10092233
20V803	10094830
20V804	10114949
20V805	10114950
20V806	10117738
20V807	10098855
20V808	10058171
20V809	10042622
20V810	801582
20V811	10040667
20V812	10049058
20V813	10049057
20V814	10076729
23Z894	10105271
23Z895	10117244
23Z901	SRSSK200
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2TEX8	10046946
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2TEY3	10048279
2TEY4	10082834
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2TEY6	10076716
2TEY7	10076717
2TEY8	10076731
2TEY9	10076733
2TEZ2	10061817
2TEZ4	10089967
2TEZ6	10061821
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2YA41	10092523
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2YRD7	10083802
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3JNU8	10050613
3JYL4	10048120
3KXF2	10004760
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3NGG6	10063441
3NGJ2	10062312
3NGJ3	10041517
3NGJ4	10041519
3NGJ5	10041518
3NGJ6	10041590
3NGJ7	10041591
3NGJ8	10041592
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3NLX5	486364
3NLX6	10048180
3NLX7	491120
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3NNF7	800376
3NNF8	494217
3NPD7	87970
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3PB95	10031348
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3PDP4	SRCA401
3PDP5	SCE109001
3PDP6	SRB675009
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3PE14	10034018
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3PPP5	10028996
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3PRA7	460184
3PRA8	459711
3PRA9	461958
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3PTU9	10047438
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3PTV3	1010GSW
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3PTY7	360SFS RED
3PTY8	360SFS WHITE
3PTY9	360SFS YELLOW
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3PTZ2	C-MOD-613111200
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3PTZ6	C-MOD-B3B111200
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3PTZ9	C-MOD-B4B111200
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3PUC6	10072480
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3RRL4	454736
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3RRR5	454723
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3RRU7	10035213
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3RRU9	10034031
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3THJ8	10078713
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4DA84	10041550
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4DEG6	10086996
4DEG8	10109109
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4DKZ4	B-20090-001
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4KRG3	C-TRD-B4C2A3220
4KRG4	C-TRD-B5C2A3220
4KRG5	C-TRD-5152A3220
4KRG6	C-TRD-5252A3220
4KRG7	C-TRD-5452A3220
4KRG8	C-TRD-5552A3220
4KRG9	C-MOD-E1D2A2200
4KRH1	C-MOD-E2D2A2200
4KRH2	C-MOD-E4D2A2200
4KRH3	C-MOD-E5D2A2200
4KRH4	S10KP

Grainger Item #	MSA Part#	Grainger Item #	MSA Part#	Grainger Item #	MSA Part#	Grainger Item #	MSA Part#	Grainger Item #	MSA Part#
5JGE8	4KRJ24KRH5 10071006	4LP60	803944	4RB27	10016742	5JGF4	10095181	6RPZ7	10116925
4KRH6	10037315	4LP61	803945	4RB28	10005383	5JGF5	10095182	6RPZ8	10116926
4KRH7	S549P	4LP62	803947	4RB29	10109107	5JGF6	10095183	6RPZ9	10116927
4KRH8	S550P	4LP63	803948	4RB30	10017934	5JGF7	10095162	6RRA0	10116928
4KRH9	10077117	4LP64	804132	4RB33	10021610	5JGF8	10095163	6RRA1	10116929
4KRJ1	10077118	4LP65	804133	4RB35	10005882	5JGF9	10095164	6RRA2	10107603
4KRJ2	10077119	4LP67	804135	4RB37	10021292	5JGG0	10095165	6RRA3	10110445
4KRJ3	10077120	4LP68	804136	4RB41	81391	5JGG1	10042346	6RRA4	10110446
4KRJ4	M9P	4LP69	804138	4RB42	804944	5KAW1	10100625	6RRA5	10111213
4KRJ5	10049738	4LP70	804140	4RB43	804946	5KAW2	10100627	6RRA6	10111215
4KRJ6	M8P	4LP71	804141	4RB44	804947	5KAW3	10100629	6RRA7	10099397
4KRJ7	10065952	4LP72	804405	4RB45	10033650	5KAW4	10100628	6RRA8	10114835
4KRJ8	M6P	4LP73	804411	4RB46	10033651	5KAW5	10075541	6RRA9	10114837
4KRJ9	10049739	4LP74	804589	4RB47	10033652	5KAW6	10103908	6RRC0	10110488
4LM93	815355	4LP75	807024	4RB48	10033653	5KAW7	10104254	6RRC1	10110489
4LM94	815356	4LP76	710918	4RB49	10033654	5KAW8	460409	6RRC2	10111212
4LM95	815357	4LR04	710981	4RB50	10033655	5KAW9	460389	6RRC3	10111214
4LM96	815358	4LR06	11354	4RB51	10052947	5KAX0	482002	6RRC4	10095774
4LM97	815359	4LR09	471310	4RB52	10052945	5KAX1	10102193	6RRC5	10051144
4LM99	815361	4LR10	808073	4RB53	10050611	5KAX2	10102233	6RRC6	10050984
4LN01	815362	4LR26	697287	4RB54	10068890	5KAX3	10102194	6RRC7	10050985
4LN02	815363	4LR28	480267	4VP34	818384	5KAX4	460018	6WTJ8	507119
4LN03	815364	4LR30	808076	4VP35	818385	5KAX5	460069	6WTJ9	SFP3267504
4LN04	815365	4LR32	815452	4VP36	818386	5KAX6	10098032	8AA76	506203
4LN05	815366	4LR33	471286	4VP37	818387	5KAX7	10098031	8CNF2	660CFSC
4LN07	815368	4LR35	480259	4VP38	818388	5KAX8	697410	8CNF3	660CGSB
4LN08	815369	4LR36	808071	4VP39	818389	5KAX9	804630	8DGX6	817092
4LN09	815641	4LR37	808074	4VP40	818390	5KAY0	804629	8DGX8	807570
4LN14	493020	4LR40	815444	4VP41	818391	5KAY1	804631	8DK47	10051146
4LN15	493108	4LR41	471298	4VP42	818392	5KB64	10031542	8DR54	10051141
4LN41	803622	4LR42	480263	4VP43	818393	5KB65	10029298	8DU15	BAHD30G0G2220
4LN50	10087218	4LR43	808072	4VP44	818394	5KB67	10042448	8DU79	10051154
4LN51	454232	4LR44	808075	4VP45	818395	5KB68	10023887	8DU80	10052512
4LN52	10087220	4LR46	815448	4VP46	818396	5KB69	10023885	8DU81	10049806
4LN54	473334	4LR49	812022	4VP47	818397	5KB72	10056424	8EPZ9	10007653
4LN56	488159	4LR51	489219	4VP48	818398	5LE90	10061272	8GEA8	477483
4LN58	10021614	4LR52	489353	4VP49	818399	5LE91	10034487	8LC33	A-M7LD10D0D22AA0
4LN60	488131	4LR53	815392	4VP50	818400	5NJC7	10092167	8PLC4	660CFSY
4LN61	488132	4LR54	815401	4VP51	818401	5NJC8	10092169	8PNY6	455022
4LN68	463943	4LR57	464031	4VP52	818402	6BU69	655837	8RLY9	492435
4LN69	475359	4LR58	464032	4VP53	818403	6BU70	655932	8UVT2	10049804
4LN70	475368	4LR59	464033	4VP54	818404	6BU71	655789	8UVT3	10049805
4LN75	488146	4LR60	464046	4VP55	818405	6BU73	655863	8UWM3	473285
4LN76	463946	4LR63	492790	4VP56	818406	6BU74	10045035	8VLH6	501390
4LN77	475362	4LR64	815175	4VP57	818407	6BU75	467895	8WZA4	477484
4LN81	475395	4LR65	815176	4VP58	818408	6BU76	711228	8XF24	10051717
4LN83	463945	4LR66	815394	4VP59	818409	6BU77	711227	8YC56	10007651
4LN84	475361	4LR67	816662	4VP60	818410	6BU78	458480	8ZCM2	660CFSR
4LN85	463947	4LR68	815397	4VP61	818411	6BU79	10065220	8ZED5	10049808
4LN86	475363	4LR69	816287	4VP62	818412	6BU81	10061050	9AJW2	10023569
4LN92	454728	4LR71	816357	4VP63	818413	6CCY2	10087439	9AN72	86537
4LN94	463942	4LR72	816661	4VP64	818414	6CCY3	10087429	9AR76	10007654
4LN95	475358	4LR73	496081	5DFG8	10021611	6CCY4	10087422	9D111	476928
4LN96	475369	4LR74	815177	5DFG9	10021616	6CCY5	10087436	9DGT9	506207
4LP02	463944	4LR75	815182	5DFH0	10031191	6CCY6	10087426	9EXL0	660CGSC
4LP03	475360	4LR76	815186	5EMN8	10094740	6CCY7	10087399	9EZZ1	10007650
4LP06	459458	4LR78	815188	5EMP1	10040665	6CCY8	10092878	9FLG7	473284
4LP14	34929	4LR89	455299	5EMP2	10040664	6CCY9	10092879	9HE06	A-M7HD10D2D22AA0
4LP18	458481	4MC42	449895	5EMP3	10042621	6CCZ0	10092880	9HX94	455021
4LP25	478191	4MC94	461769	5EMP4	10076736	6GVC7	804629	9HXE1	660CGSR
4LP27	804769	4MD09	467897	5EMP5	10076735	6GVC8	10075541	9K979	10035644
4LP28	804770	4MD30	475366	5EMP6	10078256	6GVD0	805078	9KD28	10007652
4LP38	710288	4MD32	475370	5EMP7	10078259	6GVD1	10083790	9PXY9	469619
4LP40	488543	4MD41	475396	5EMR0	10075893	6GVD2	10083782	9RNE8	660CFSW
4LP41	487500	4MD46	475407	5EMR2	10103262	6GVD3	10083786	9RNW6	A-M7LD10D2D22AA0
4LP42	487334	4MD47	475408	5EMR3	10107602	6GVD4	697444	9RY45	660CFSB
4LP43	485680	4MD50	476356	5EMR4	10110443	6GVD5	10049638	9UDK6	660CGSW
4LP44	487333	4MD75	487335	5EMR5	10110444	6GVD6	10099274	9WHA1	660CGSY
4LP45	487336	4MD82	488127	5ERK9	10106722	6GVD7	10049623	9WXC3	A-M7HD10D0D22AA0
4LP46	487338	4MD88	488160	5ERL2	10106725	6GVD8	10075799	9XHW1	465420
4LP47	487339	4MF39	804142	5ERL3	10106729	6GVD9	10085084	9XJ92	454668
4LP48	487340	4MF42	804406	5JGE5	10102182	6JR22	10020850	9XXY3	55716
4LP49	487341	4MF48	804428	5JGE6	10102183	6JR24	10034263	9XXY4	69542
4LP50	487342	4MF49	804429	5JGE7	10102184	6JR26	815692	9XXY5	69541
4LP54	497101	4MG01	815178	5JGE8	10097807	6JR27	815696	9YAC2	11955
4LP56	497649	4MG02	815179	5JGE9	10097883	6JR28	815700	9YAX7	479875
4LP57	497664	4MG03	815180	5JGF0	10097886	6JR29	818342	9YF33	475367 RATCHET
4LP58	800300	4MG04	815181	5JGF1	10097888	6JR30	818343	9ZGL8	10037315
4LP59	803943	4MG06	815185	5JGF2	10097891	6JR31	818346	9ZKP8	10047370
		4RB25	475371	5JGF3	809999	6RPZ6	10116924	9ZXN0	96329