MALAYSIA MADANI

COSH 2024
24th CONFERENCE AND EXHIBITION ON OCCUPATIONAL SAFETY AND HEALTH

SCICOSH
6th SCIENTIFIC CONFERENCE ON OCCUPATIONAL SAFETY AND HEALTH

19-20 FEBRUARY 2024 | KUALA LUMPUR CONVENTION CENTRE

MINISTRY OF HUMAN RESOURCES

NIOSH

Bullard®

SAFETY. SINCE 1898.™

Supplied Air Respirator Setup

for Abrasive Blasting and Coating Operation

Cheong Si Swan
Bullard Asia Pacific

cosh.niosh.com.my

THE FUTURE OF WORK

Agenda

- Safety Hazards in blasting and painting
- Potential Health Risks
- Safety Solutions for Blasters
- What is NIOSH Type CE respirator
- Safety Solutions for painters
- How to setup Supplied Air Respirator

Safety Hazards of Abrasive Blasting

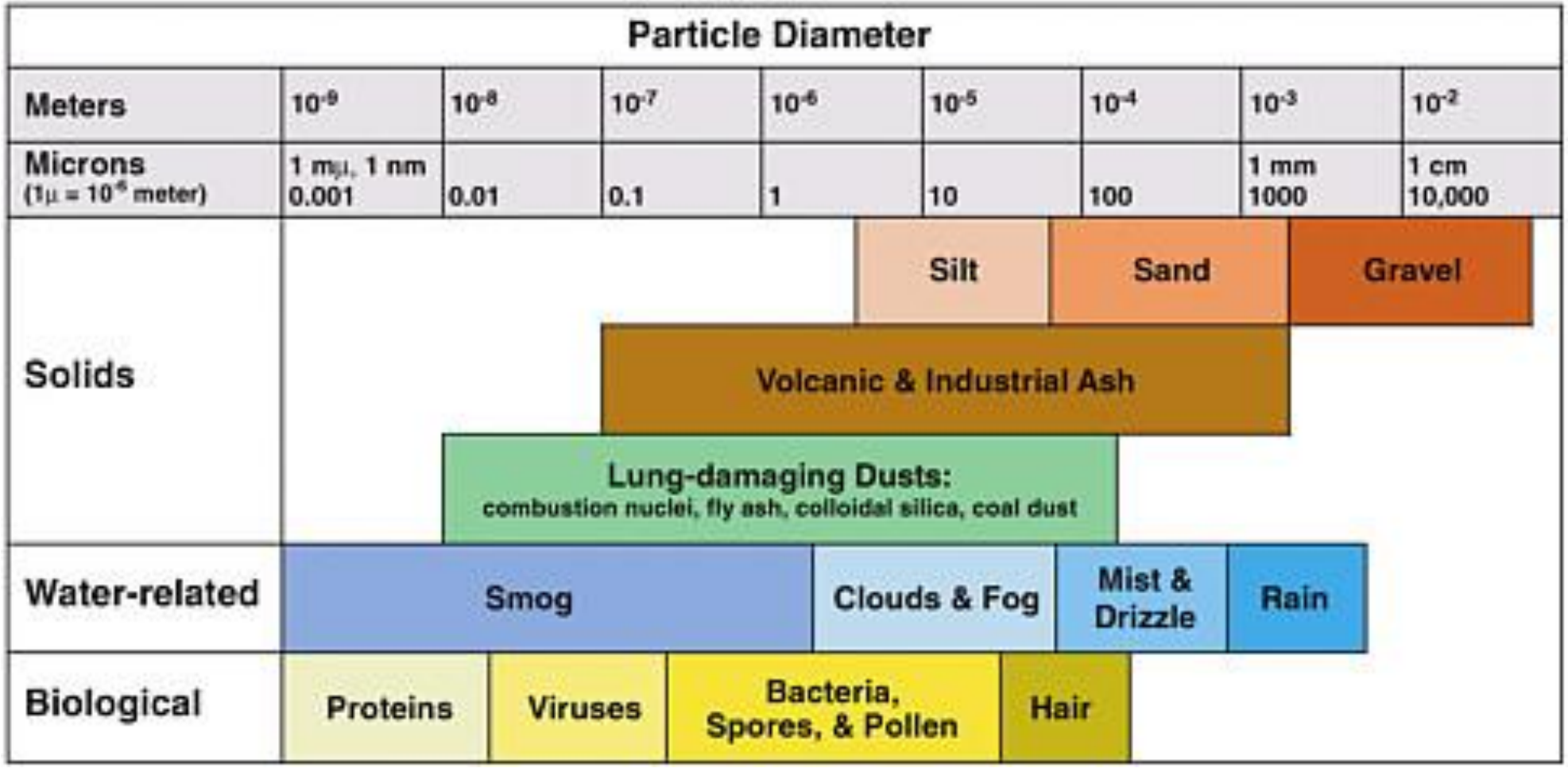
- Exposure to **toxic dusts**
- **High noise** levels
- **Heat Stress**
- **High-speed and high-pressure**

Exposure to large quantities of Toxic Dusts

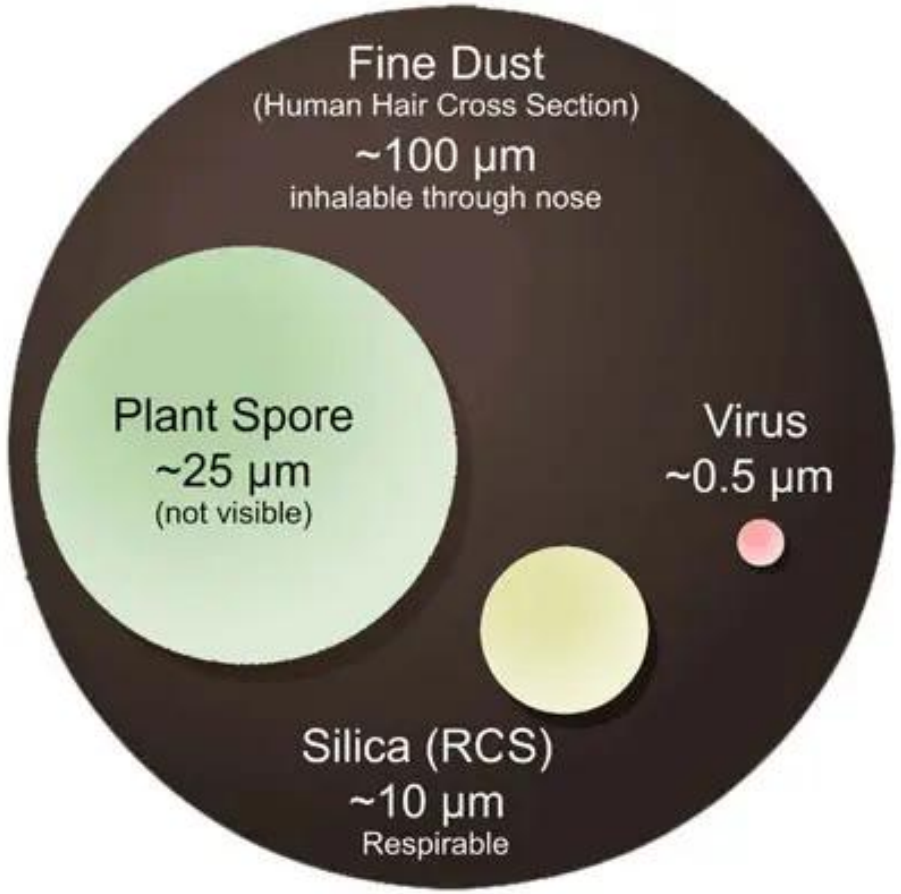
Source	Potential Air Contaminants
Base Material (e.g., steel, aluminum, stainless steel, galvanized steel, copper-nickel and other copper alloys)	Aluminum, cadmium, chromium, copper, iron, lead, manganese, nickel, and zinc
Surface Coatings (e.g., pre-construction primers, anticorrosive and antifouling paints)	Copper, barium, cadmium, chromium, lead, tributyl tin compounds, zinc
Abrasive Blasting Media (e.g., coal slag, copper slag, nickel slag, glass, steel grit, garnet, silica sand)	Arsenic, beryllium, amorphous silica, cadmium, chromium, cobalt, crystalline silica, lead, manganese, nickel, silver, titanium, and vanadium

Sources: EPA, 1997; EPA, 2000; NFESC, 1996; NIOSH, 1998.

Particle Size



Particle Size



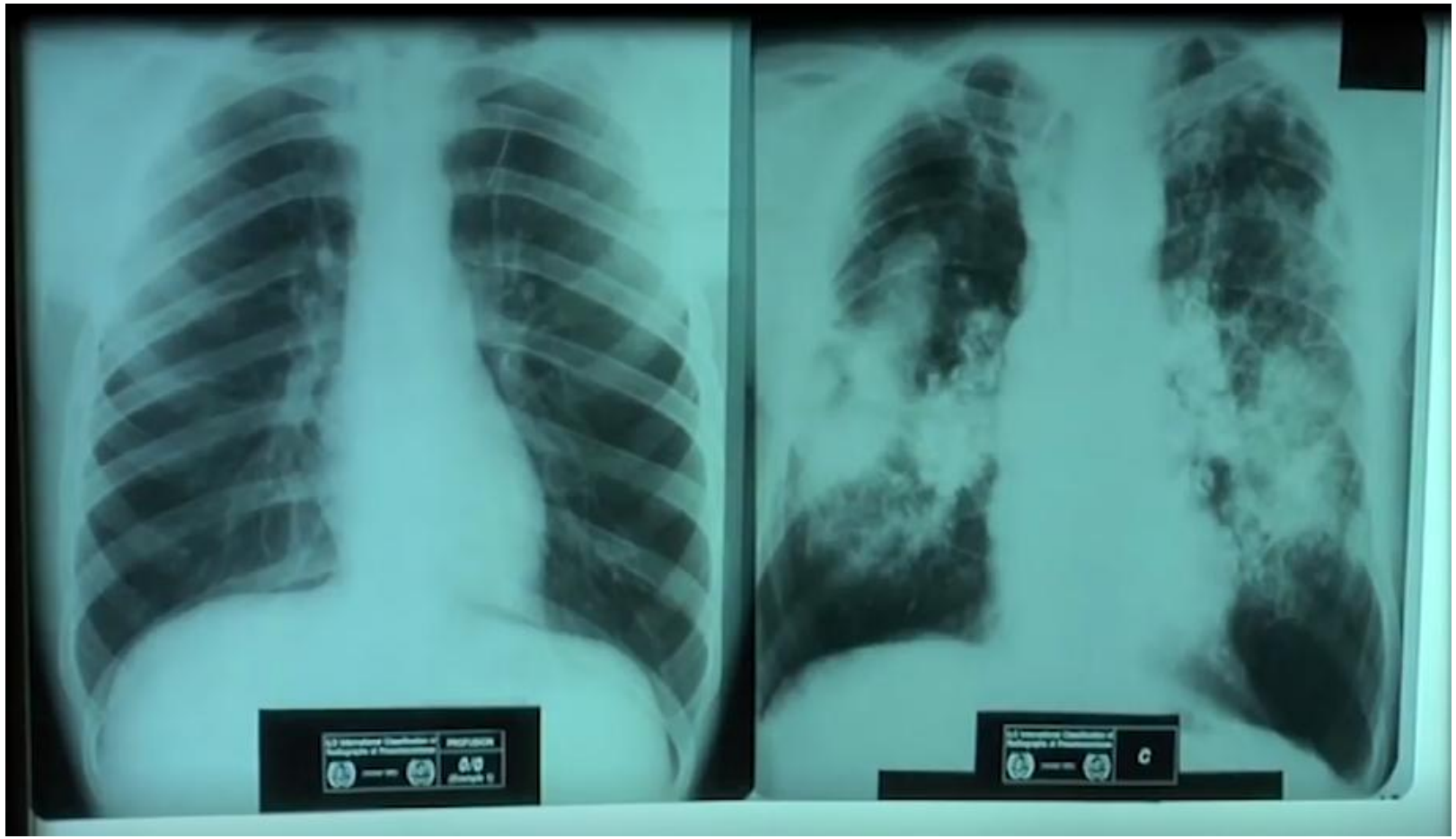
Particulate matter of ≤10µm (PM10) is the approximate size threshold for particles to be able to penetrate the body's natural defenses (mucus membranes, cilia, etc.) and reach deep into the lungs, potentially causing serious health issues.

[1] Staff, “Particles: Size Makes All The Difference”, National Institute of Environ Triangle Park, NC, 2006. https://www.niehs.nih.gov/health/assets/docs_a_e/ehp_student_edition_lesso fference.pdf

Potential health hazards exposure to toxic dust

OSHA® Occupational Safety and Health Administration

DEPARTMENT OF LABOR · UNITED STATES OF AMERICA



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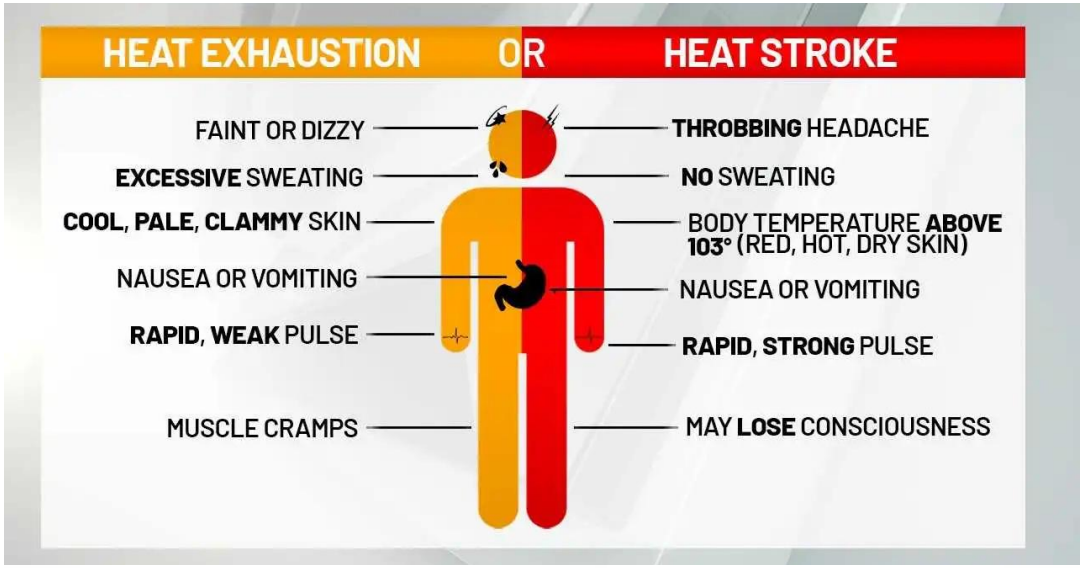
Other Safety Hazards - Exposure to Noise

The current PEL is **90 dB(A)** with employers taking action at 85 dB(A), both measured as eight-hour time-weighted averages

Typical Noise Levels Associated with Abrasive Blasting

- Air discharge from blast nozzle: 112 to 119 dB(A)
- Supply air inside operator's helmet: 94 to 102 dB(A)
- Air compressors: 85 to 88 dB(

Other Safety Hazards – Heat Stress



Abrasive blasting operators are at risk of heat-related illnesses due to :

- The PPE that is worn
- The work activity or physical demands of the job
- Environmental conditions (i.e., temperature, humidity, and air movement).

Other Safety Hazards – High-speed and high-pressure

- Employees engaged in abrasive blasting can be struck by high-speed particles from the blasting media or the surface being blasted (substrate). Potential injuries can include particles becoming embedded in the skin, eye damage, severe cuts, and burns.

Total PPE Solution for Blaster

Respiratory & High-Speed Particles Protection

NIOSH Approved Respirator

Breathing Hose

Heavy Duty Blast Gloves

Heavy Duty Blast Suit

Air Quality & CO Monitor

Air Filter and CO Monitor

Free-Air® Pumps

Body Temperature Management

Cooling Solution

Other Accessories

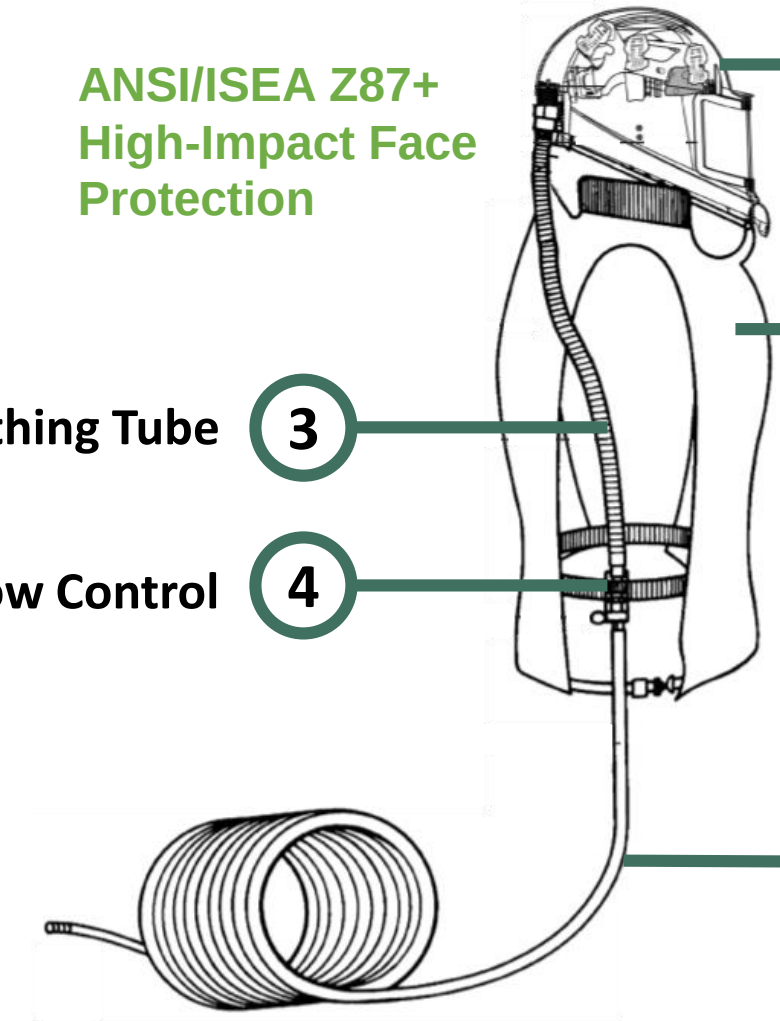
Communication System

Hands-free Lighting

Knee Pad

Approved Sand Blasting Respirator Type CE COMPONENTS

ANSI/ISEA Z87+ High-Impact Face Protection



1. **Head Top**

   ANSI/ISEA Z89.1, Type 1, Class C Head Protection
2. **Cape or Shroud**
3. **Breathing Tube**
4. **Flow Control**
5. **Airline**

NIOSH Approved Type CE Abrasive Blasting Respirator

Type CE

NIOSH Type CE Respirator

A Type CE **supplied-air respirator** equipped with additional devices designed to **protect the wearer's head and neck against impact and abrasion** from rebounding abrasive material, and with shielding material such as plastic, glass, woven wire, sheet metal, or other suitable material to protect the window(s) of facepieces, hoods, and helmets which do not unduly interfere **with the wearer's vision** and permit easy access to the external surface of such window(s) for cleaning.

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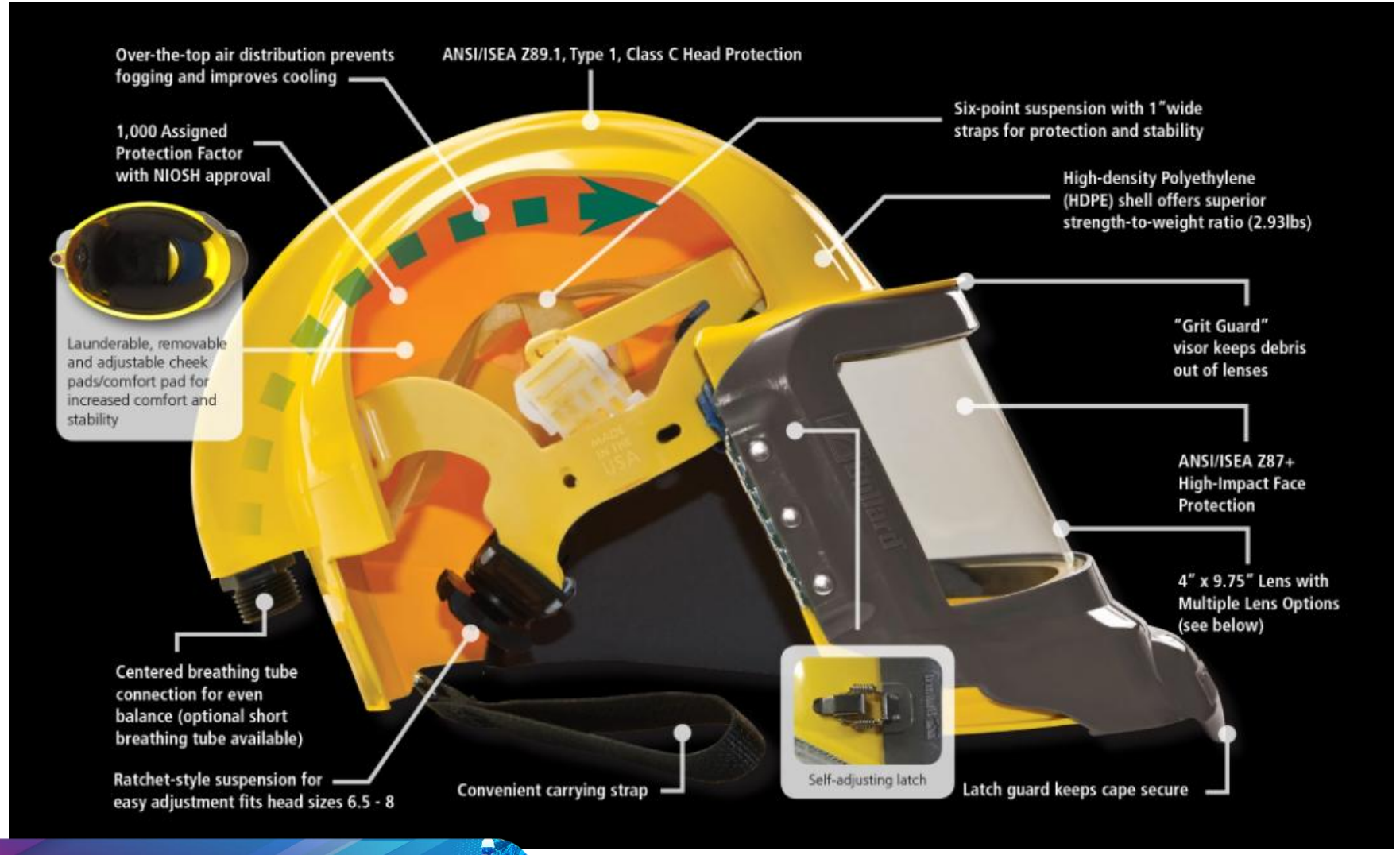
Non-NIOSH approved respirator

NIOSH Approved Type CE Abrasive Blasting Respirator



- ✓ NIOSH Approved 1000 Assigned Protection Factor
- ✓ ANSI/ISEA Z89.1, Type 1, Class C Head Protection
- ✓ ANSI/ISEA Z87+ High-Impact Face Protection
- ✓ Noise Reduction

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How to tell your respirator is NIOSH approved?

Bullard
1898 Safety Way
Cynthiana, KY 41031-9303
877-BULLARD (285-5273)

Model GenVX Series
Type C Continuous Flow Supplied-Air Respirator
Approved Only in the Following Configurations:

RESPIRATOR COMPONENTS

TC-	PROTECTION[1]	MODEL	HOOD	BREATHING TUBE	ALTERNATE CAPE ASSEMBLIES													
		GENVX SERIES RESPIRATOR	GENVX	GVXBT	28VX	28ORVX	46VX	4616VX	38VX	38ORVX	13VX	1316VX	GGVX	21821	PKVX	PKXLVX	36VX	36XLVX
19C-0491	SA/SB/CF	GENVX	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

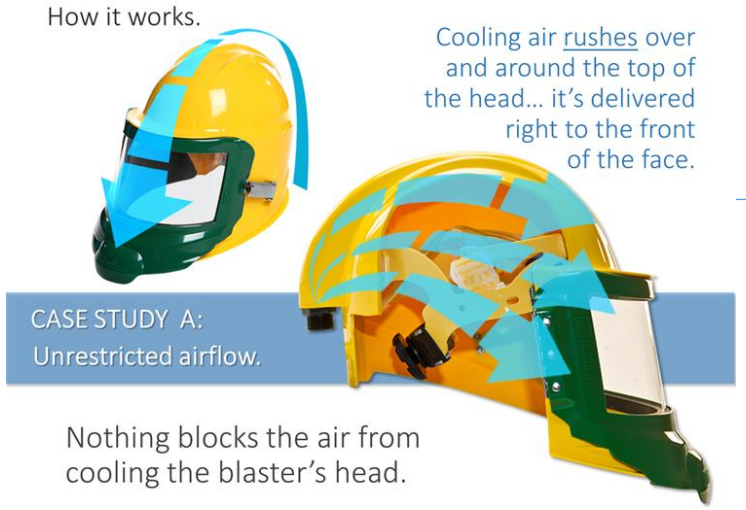
TC-	ALTERNATE FLOW CONTROL DEVICE								
	AC100030	AC100030B	AC100030S	AC100031	AC100032	AC100033	AC100034	AC100037	AC100038
19C-0491	X	X	X	X	X	X	X	X	X

TC-	AIR HOSE																					
	54513	54512	54511	54510	5454	5458	5457	5454GOV	46919	46918	46917	46915	46916	46913	4696	469650	4696100	V2050STSHUTOFF	V2025STSHUTOFF	V2050ST	V20100STSHUTOFF	V20100ST
19C-0491	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

TC-	ACCESSORIES				ALTERNATE SUSPENSIONS		ALTERNATE LENSES						CAUTIONS AND LIMITATIONS[2]
	GVXCP	36501	4612	GVXCS	GVXPL	GVXRT	GVXIL	GVXOLT	GVXOLG	GVXOL40	GVXOL15	GVXLC	
19C-0491	X	X	X	X	X	X	X	X	X	X	X	X	ABCDEJMNOS

PPE for Blaster

Comfort



To reduce blaster heat & body stress.

Lightest Weight
1kg.

Coolest
by 17°

Customizable Fit
4x

Most Airflow
100%

Increase Worker Comfort & Productivity

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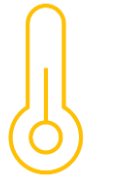
Safety Hazards of Painting & Coating

Exposure to **particles and vapors**

Confined Spaces



Heat Stress

Chemical Contact

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SAFETY. SINCE 1898.™

Total PPE Solution for Painter

Respiratory & Chemical Contact Protection

NIOSH Approved Respirator

NIOSH Approved Respirator

NIOSH Approved Hard Shell Respirator

Breathing Hose

Air Quality & CO Monitor

Air Filter and CO Monitor

Powered Air Purifying Respirator

Free-Air® Pumps

Body Temperature Management

Cooling Solution

Other Accessories

Communication System

Hands-free Lighting

Safety Eyewear

Lens Cover

Bullard CC20 Airline Hoods

Safety

- Assigned Protection Factor 1,000
- Chemical Resistant DuPont™ Tychem®

Comfort

- Light weight
- Cold air Supply
- Wide angle lens

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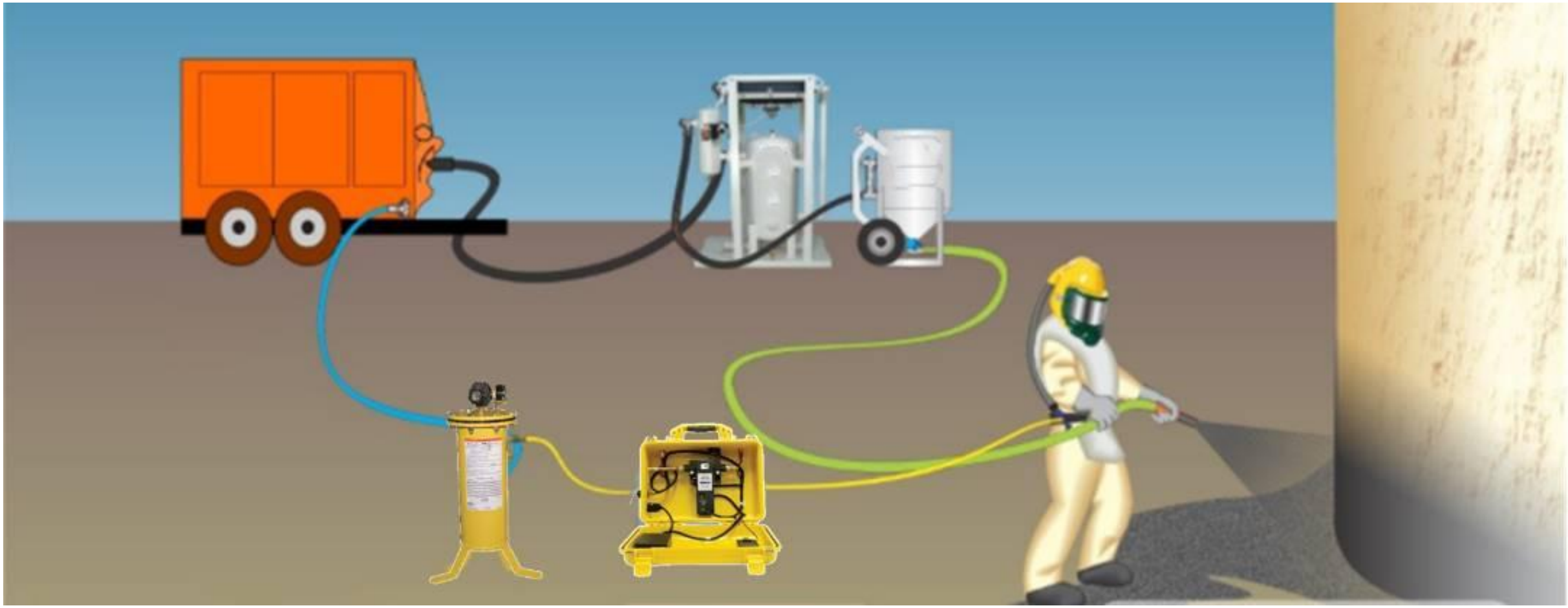
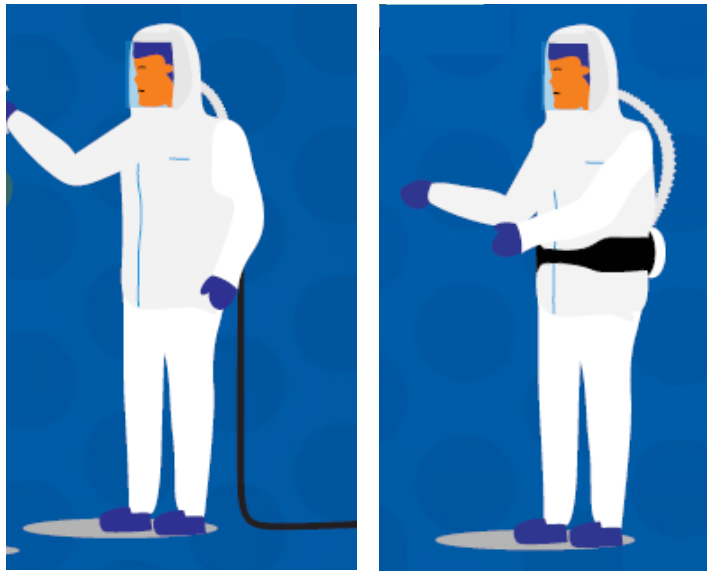
How to setup Supplied Air Respirator



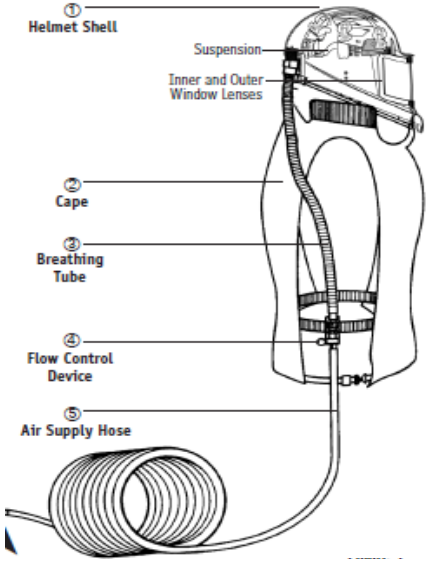
REGULATORY

OSHA AND NIOSH

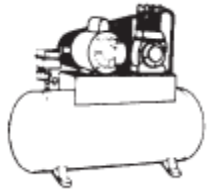
National Institute for Occupational Safety and Health NIOSH



NIOSH **approves** Respiratory **Systems**
- Nose to Hose or Nose to PAPR



ALL system **components** must be the **same manufacturer**



NIOSH does **not** approve **pumps** or **compressors**

TC

NIOSH **approval** is **recognized** by a **TC Number**

OSHA®

- OSHA **enforces** respiratory protection standards and use
- OSHA only **recognizes NIOSH** approved **systems**
- OSHA **sets** Permissible Exposure Limits ***PEL***
- OSHA **defines** a respiratory protection **program**

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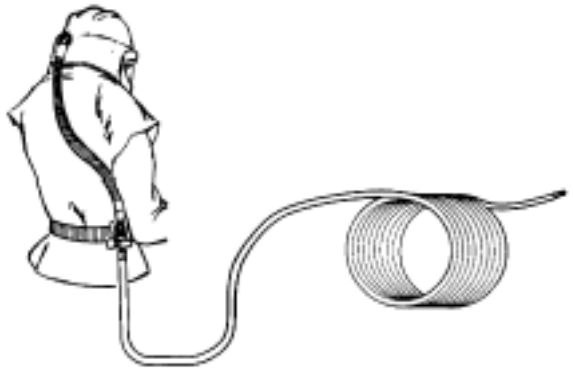
Grade D Breathing Air Compliance

- Set by Compressed Gas Association
- OSHA 1910.134 References NIOSH 42CFR84.141(b)
- Oxygen 19.5%-23.5%
- Hydrocarbons or oil (condensed) 5mg/m^3 max.
- Carbon Monoxide (C0) 10 ppm max
- Carbon Dioxide (CO_2) 1,000 ppm max
- Odor – no noticeable taste or smell
- No toxic contaminants at levels that make the air unsafe to breathe

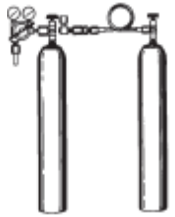
PPE for Blasting Operator



POA =Point of Attachment

The point-of-attachment is the point at which the air supply hose connects to the air source.

POA

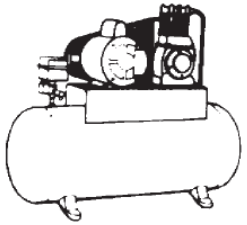


Grade D Breathing Air Cylinder System

POA

Free-Air® Pump

POA



Air compressor

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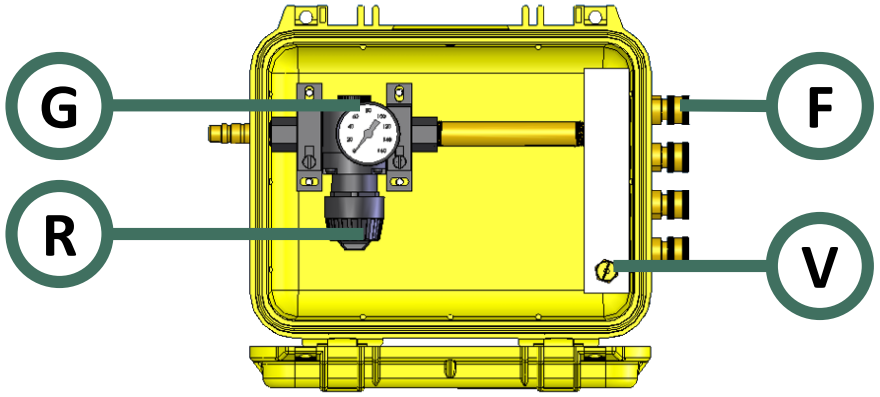
Point of Attachment

- **All** Airline Respirators **must connect** to a "Point of Attachment" or **POA**
- **Required** by **NIOSH and OSHA**
- **POA Requirements:**
  - Pressure gauge
    - Allows verification of the pressure setting at the point of attachment (see 84.149 (b)).
  - Regulator
    - Allows adjustment of air pressure to manufacturer's specified pressure range based on range of hose length used (see 84.149 (b)).
  - Pressure relief valve
    - Prevents pressure from exceeding 125 psi (see 84149 (d) (1)).
  - Congruous fitting
    - Allows connection of "Detachable couplings" as part of NIOSH approved respirator system (see 84.131 (5)).

Point of Attachment

1 Free-Air Pumps

2 Air Compressors



G **Pressure Gauge**

R **Regulator**

F **Congruous fitting**

V **Pressure Relief Valve**

Why must have a CO Monitoring?

- **OSHA requires** that all **Oil lubricated** compressors **must** have a **high-temperature** or **carbon monoxide** alarm

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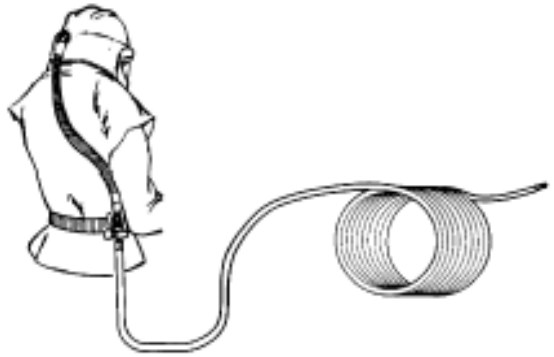
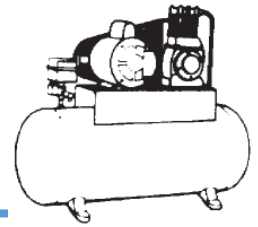
Point of attachment setup for Blasting / Coating Operation

POA



7-Stage Filtration

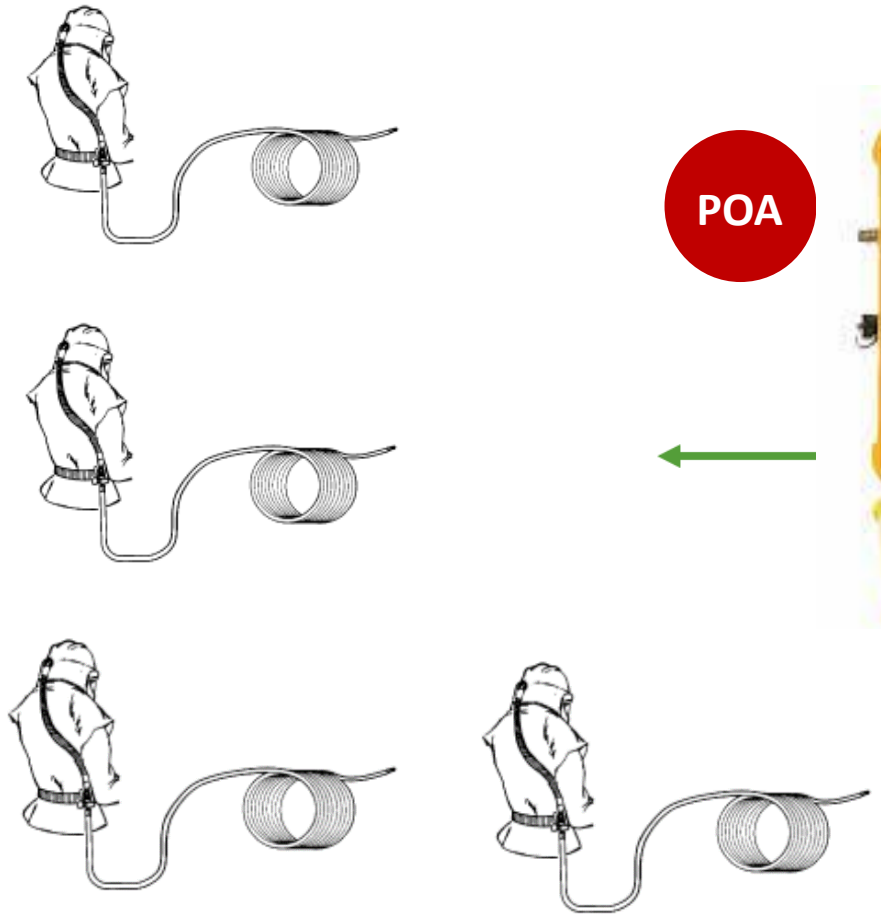
CO Monitor for High Pressure



Air compressor

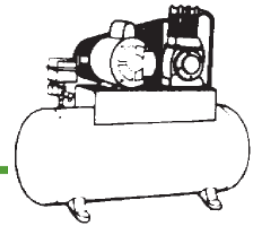
Bullard SAFETY. SINCE 1898.™

Point of attachment setup for Blasting / Coating Operation



POA

All-in-One
CO Monitor & Filtration



Air compressor

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Type of point of attachment And Filtration

Air Gladiator filter with External CO Monitor

Air Guard with 3 stages filtration, CO, Dew point monitor and data logging

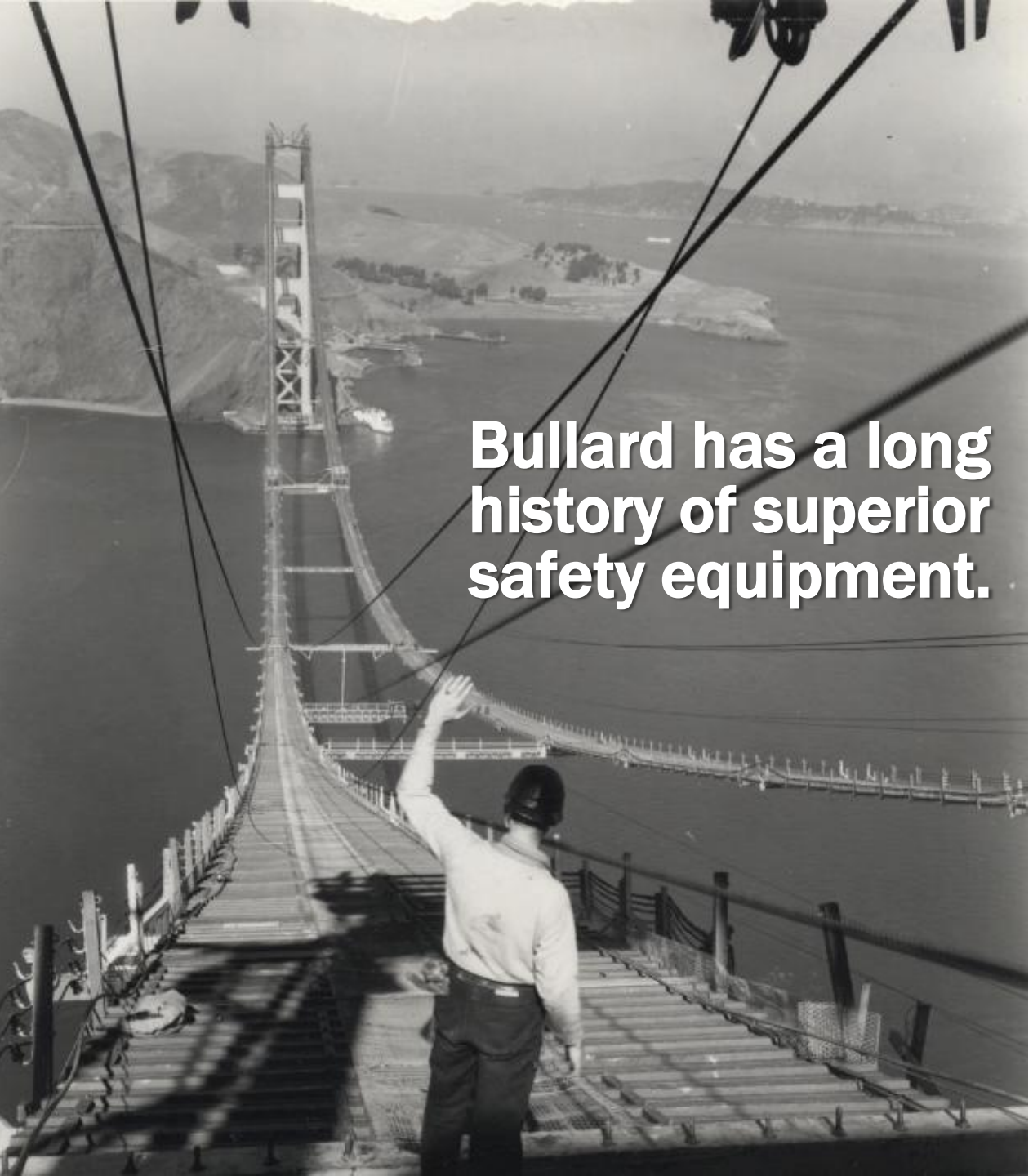
Clean Air Box with 3 stages filtration and CO monitor.

Type of point of attachment And Filtration

Wall Mounted Clean Air Filtration with CO monitor and independent outlet regulator

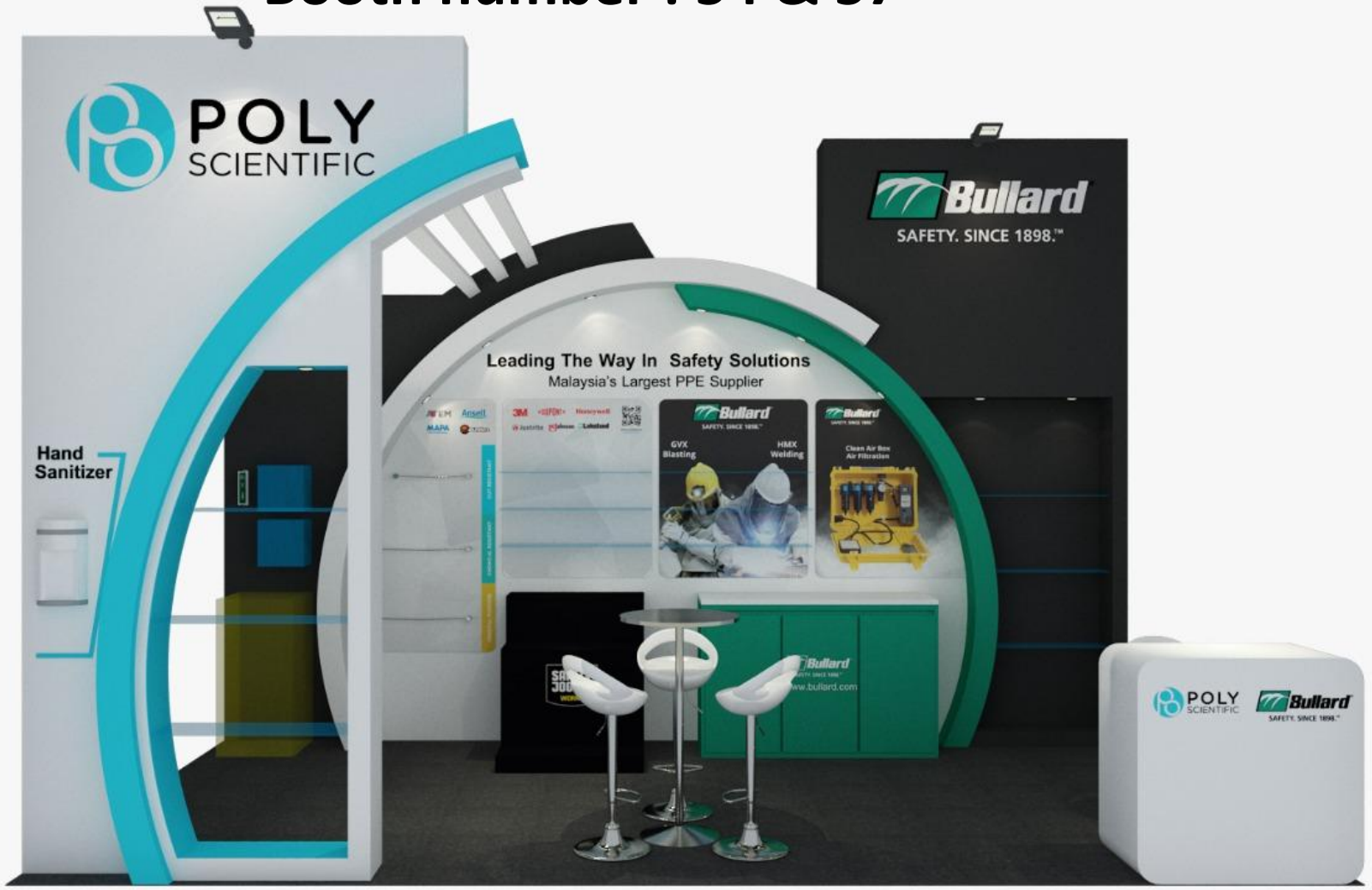
Remote Air Manifold with independent outlet regulator

One Outlet Remote Air Manifold



We invented the blasting respirator for the Golden Gate Bridge
in 1932.

Booth number : 54 & 57



Q&A

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THANK YOU

SPEAKER GUIDELINE

NOTICE TO THE PRESENTER OF THE COSH & SciCOSH

With all due respect, we are pleased to inform you some important points that need to be given attention by the presenters as follows:

i) ATTIRE

- Presenters are required to dress neatly and wear **coats/blazers** during the presentation.

ii) SLIDE PRESENTATION

- Presenters need to ensure that the **presentation slides use a minimum of 20 font sizes** to ensure that the information in the presentation slides can be seen.
- The PowerPoint used is a **version of 2010 and above**.
- Presenters are **requested to submit final presentation slides** to the NIOSH Liaison Officers
- A presentation (especially conclusion part) should be associated with COSH/ SciCOSH theme
- Should avoid all sensitive issues (e.g. race, religion, politic etc.)
- Should avoid to promote own business excessively
- Presentation should be in English.

iii) DURING PRESENTATION (FOR 60 MIN & 30 MIN SESSION)

- You are given **50 minutes** to present for **workshop session** (It is highly advisable not to exceed 15-- 20 slides)
- You are given **20 minutes** to present for **paper session** (It is highly advisable not to exceed 10-15 slides)
- The **question and answer session** will continue for **10 minutes** after the end of the presentation session.

iv) ATTENDANCE IN THE PRESENTATION HALL

- Presenters are asked to be **ready 30 minutes early** in the presentation hall.

The cooperation and willingness of Prof/Dr/Sir/Madam to comply with this matter are greatly appreciated.

Thank You.