Respirators – Which One? Does It Fit?

Matching the respiratory protective device with the situation is as important as selecting the right tool for the job.

Popular Science, December 1940.
WPS New Requirement

- WPS-labeled pesticide products: Respirator Requirements per OSHA 1910.134
  - Medical Evaluation
  - Fit test
    - Only NIOSH Certified Respirators permitted
- Training
- Recordkeeping
WPS Respirator Use

- Follow the:
  - Label
  - WPS medical evaluation, fit testing and cleaning

- WPS does not require a written respirator program
“Ag” Respirator Use

- For non-”Agricultural Use” pesticides and chemicals MIOSHA Part 700 applies
  - Part 700 does not require a written respirator program
- For respirator required “non-agricultural” work activities (even though done on a farm) MIOSHA Part 451 applies
  - Part 451 requires a written respirator program
The Respiratory System

Particle Size Matters

http://www.acrd.bc.ca/particulate-matter
Particle Size Matters
Two Classes of Respirators

- **Air-purifying respirators** - respirators with an air-purifying device (filter, cartridge/canister) that removes air contaminants before the air is inhaled.
  - Negative Pressure (wearer doing the work)
  - Positive Pressure (pump doing the work)
- **Atmosphere-supplying respirators** - provide clean breathing air from an uncontaminated source
Air Purifying Respirators

- **Tight Fitting:**
  - Medical Evaluation
  - Fit Test
  - User Seal Check

- **Loose Fitting:**
  - Medical Evaluation
Air Purifying, Tight Fitting, Negative Pressure Respirators

- Filtering facepiece (dust mask)
- Elastomeric respirators
  - Uses replaceable filters, canisters and cartridges

Half-face

OSHA APF = 10

Full-face

OSHA APF = 50
Air Purifying, Loose-Fitting, Positive Pressure Respirators

3M OSHA APF=1000

OSHA APF = 25
Uses replaceable filter (mounted in helmet)
Choosing a Respirator

- Depends upon:
  - Type and concentration of contaminant
  - Need for eye, face protection
  - Need for supplemental air/oxygen
  - Presence of facial hair
- Make sure NIOSH certified
Choosing a Respirator: Facial Hair Dilemma

Facial Hairstyles and Filtering Facepiece Respirators

- **Clean Shaven**: OK
- **Stubble**: Not recommended
- **Long Stubble**: Not recommended
- **Full Beard**: Not recommended
- **French Fork**: Not recommended
- **Ducktail**: Not recommended
- **Verdi**: Not recommended
- **Garibaldi**: Not recommended
- **Bandholz**: Not recommended
- **Soul Patch**: OK
- **Goatee**: Not recommended
- **Chin Curtain**: Not recommended
- **Extended Goatee**: Not recommended
- **Circle Beard**: Not recommended
- **Anchor**: Not recommended
- **Balbo**: Not recommended
- **Van Dyke**: Not recommended
- **Imperial**: Not recommended
- **Side Whiskers**: OK
- **Mutton Chops**: Not recommended
- **Hulhee**: Not recommended
- **Horseshoe**: Not recommended
- **Zappa**: Not recommended
- **Walrus**: Not recommended
- **Painter's Brush**: Not recommended
- **Chevron**: Not recommended
- **Handlebar**: Not recommended
- **Pencil**: OK
- **Toothbrush**: OK
- **Lampshade**: Not recommended
- **Zorro**: Not recommended
- **Villain**: Not recommended
- **Fu Manchu**: Not recommended
- **English**: Not recommended
- **Dali**: Not recommended

*If your respirator has an exhalation valve, some of these styles may interfere with the valve working properly if the facial hair comes in contact with it.

This graphic may not include all types of facial hair. For any style, hair should not cross under the respirator sealing surface.

Source: OSHA (2023). The graphic is from the CDC's Mosh program. Further reading: CDC Mosh website and Trusted Sources Webpage.

References:

https://www.osha.gov/dts/osta/otm/otmessionalhealth/medicinesafety/medical.html#case1274

For more information, visit the CDC's Mosh website.
NIOSH Approval System for Particulate Filters

- **N95/R95/P95** masks filter out 95% of dust particles
  - \(N\)=Not resistant to oil,
  - \(R\)=Somewhat resistant to oil,
  - \(P\)=Strongly resistant to oil
- **N99/R99/P99** masks filter out 99% of dust particles
- **N100/R100/P100** masks filter out 99.97% of dust particles

[https://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/respsource1quest2.html](https://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/respsource1quest2.html)

Choose Filter Efficiency
(95%, 99%, 99.97%)

Does the Aerosol Contain Oil?

YES

Will Filter Be Used More Than 8 Hours?

YES

Use P Series Filter

NO

Use R Series Filter

NO

Use N, R, or P Series Filter
Dust Masks (filtering facepieces)

- Dust masks capture airborne particles (dust, mist, fumes) but not gases or vapors (unless equipped with charcoal layer)
- Specific WPS rules for filter replacement
  - Family farm owner exempt

https://farm3.staticflickr.com/2794/4211215059_d80da56913_z.jpg
Half Mask/Full Face

- Gas & Vapor cartridge
  - Chemical cartridges trap different types of chemicals, but not dusts, mists or fumes

- Particulate cartridge
  - Trap particulates only

- Combination cartridge
  - Will trap both gas/vapor + particulate
Powered Air Purifying Respirators

- Has battery-powered fan that draws air through cartridges and blows it into the facepiece
- Can provide better protection than other cartridge respirators
  - Special filter: Only HE (High Efficiency) filters used: Filters at least 99.97% of airborne particles.
Air Supplied

- Air supplied from another source
  - Medical evaluation
  - Fit Test
Questions?
Deciphering a Pesticide Label

When applying any pesticide, remember that the label is the law.
42 CFR Part 84 Rule Changes Changed Respirator Certifications

- July 1995: National Institute of Occupational Safety and Health (NIOSH) upgraded the tests used to certify non-powered air purifying particulate respirators. TC: Test and Certify
  - Does not change chemical cartridge, SCBA, airline, gas mask, PAPR types
- Testing requirements for the following respirators or filters are eliminated:
  - Single use dust/mist respirators
  - Dust/mist respirators
  - Dust/mist/fume respirators
  - Radon daughter respirators
  - Pesticide prefilters
  - Paint spray prefilters
NIOSH TC Designations

- **Air Supplied Respirators**
  - 13F: self-contained breathing apparatus (SCBA)
  - 19C: supplied air respirator (SAR)

- **Air Purifying Respirators**
  - 14G: gas mask with canister
  - 23C: air-purifying respirator (APR) with chemical cartridge
    - Half- or full-facepiece
  - 84A: respirator with particulate filter or combination chemical cartridge with particulate filter
    - Filtering facepiece
    - Half- or full-facepiece

- **Powered Air Purifying Respirators**
  - 23C: powered air-purifying respirator (PAPR) with chemical cartridge and particulate filter
  - 21C: powered air-purifying respirator (PAPR) with particulate filter
## Translation Key for Respirator on EPA labels

<table>
<thead>
<tr>
<th>OUTDATED Respirator terms used on EPA pesticide labels</th>
<th>Current NIOSH respirator terms used on labels</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIOSH/MSHA</td>
<td>NIOSH</td>
</tr>
<tr>
<td>Dust/Mist</td>
<td>Particulate</td>
</tr>
<tr>
<td>Pre-filter approved for pesticides</td>
<td>N, R, or P filter, to be used in combination with a chemical cartridge</td>
</tr>
<tr>
<td>Canister approved for pesticides</td>
<td>Canister (contaminant specific)</td>
</tr>
<tr>
<td>N, R, P or HE filters</td>
<td>N, R or P</td>
</tr>
<tr>
<td></td>
<td>(HE filters can only be used on Powered Air-Purifying Respirators (PAPRs))</td>
</tr>
</tbody>
</table>
Label Example

- Mixer Loaders, applicators and all other handlers must wear ...
- And NIOSH approved **dust/mist filtering respirator** (MSHA/NIOSH approval number prefix **TC-21C** or a **NIOSH approved respirator** with any N, R, P or HE filter)
Remember! Dust Mist = Particulate

- NIOSH Particulate Respirators

TC-21C

TC-84A

TC-84A
Label Language

- For exposures in enclosed areas wear a respirator with an organic vapor removing cartridge with a pre-filter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C)

TC-23C  Correct??

TC-84A  Correct??

Look for the COMPONENTS: not the number!
NIOSH TC-84A vs TC-23C

**TC-84A**
Organic Vapor with combination N95 filter

**TC-23C**
Organic Vapor Cartridge only
A NIOSH approved particulate respirator with any N, R or P filter (NIOSH approval TC-84A); or a powered air purifying respirator (PAPR) with HE filters (NIOSH approval TC-21C)
A NIOSH approved respirator with an organic vapor (OV) removing cartridge with any combination N, R, or P filter (NIOSH approval number prefix TC-84A); or an OV canister (NIOSH approval prefix TC-14G); or a powered air purifying respirator (PAPR) with HE filters (NIOSH approval prefix TC-23)
Bottom Line…

- The respirator you use must fit you and be right for the job that you do!