COVID-19 PERSONAL PROTECTIVE EQUIPMENT AND SUPPLIES
PERFORMANCE STANDARDS AND GUIDELINES

The purpose of this document is to assist departments during the personal protective equipment (PPE) procurement process and serves as a guide to determine if PPE meets minimum performance standards. This helps ensure PPE will provide adequate protection to prevent COVID-19 transmission. Check references for additional requirements for specific types of work.

DISINFECTANTS AND SANITIZERS

<table>
<thead>
<tr>
<th>Item</th>
<th>Example</th>
<th>Description</th>
<th>Performance Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hand Sanitizer</strong></td>
<td>Pump</td>
<td>Hand sanitizer acts by killing certain germs on the skin. Alcohol-based hand sanitizers can quickly reduce the number of germs in many situations such as when handwashing is not available.</td>
<td>Must contain at least 60% ethyl alcohol or 70% isopropyl alcohol.</td>
</tr>
<tr>
<td></td>
<td>Auto dispenser</td>
<td></td>
<td>CDC Guidelines.</td>
</tr>
<tr>
<td></td>
<td>Wall-mount manual dispenser</td>
<td></td>
<td><strong>Avoid hand sanitizers containing methanol.</strong></td>
</tr>
<tr>
<td><strong>Surface Disinfectants</strong></td>
<td>Ready-to-use</td>
<td>Products used to disinfect surfaces against SARS-CoV-2.</td>
<td>Be on <a href="https://www.epa.gov/pesticide-registration/disinfectants">EPA Disinfectants for Use Against SARS-CoV-2</a> or <a href="https://www.americanchemicalsociety.org/solutions/whats-working/coronavirus">ACC CBC Novel Coronavirus (COVID-19)—Fighting Products</a> lists</td>
</tr>
<tr>
<td></td>
<td>Concentrated</td>
<td>Disinfection describes a process that eliminates most or all pathogenic microorganisms, except bacterial spores, on inanimate objects.</td>
<td>Pre-approved UW list: <a href="https://ehs.washington.edu/chemical-disinfectant-safety-information">UW EH&amp;S COVID-19 Chemical Disinfectant Safety Information</a></td>
</tr>
<tr>
<td></td>
<td>Dilution systems</td>
<td></td>
<td>Ready-to-use products preferred over concentrated.</td>
</tr>
</tbody>
</table>

ACC  American Chemical Society
CBC  Center for Biocide Chemistries
CDC  Centers for Disease Prevention and Control
EPA  Environmental Protection Agency
### DISPOSABLE GLOVES, GOWNS, COVERALLS, LAB COATS

<table>
<thead>
<tr>
<th>Item</th>
<th>Example</th>
<th>Description</th>
<th>Performance Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposable gloves, thin-gauge (3 – 8 mil thickness typical) 1 mil = 0.001 inch</td>
<td>Disposable nitrile gloves</td>
<td>Some chemical resistance – consult manufacturer glove resistance chart, incidental chemical contact only</td>
<td>ASTM FDA Medical Glove Guidance Strategies for Optimizing the Supply of Disposable Medical Gloves: Use of gloves conforming to U.S. and international standards.</td>
</tr>
<tr>
<td></td>
<td>(see insert below)</td>
<td></td>
<td>Note Avoid powdered gloves - banned in medical use, possible inflammation and allergic reactions.</td>
</tr>
<tr>
<td></td>
<td>Disposable vinyl gloves</td>
<td>Economical  Thinner, looser fit than nitrile. Less durable, less chemical resistance. Medical, industrial, general purpose grades (2 – 6 mil typical).</td>
<td></td>
</tr>
</tbody>
</table>

### Disposable nitrile gloves

<table>
<thead>
<tr>
<th>Mil</th>
<th>Duty</th>
<th>Characteristics</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 - 4</td>
<td>light</td>
<td>Comfort, dexterity, flexibility, tactile sensitivity</td>
<td>Medical grade (at least 4 mil typical): Hospital, chemotherapy, clinic, lab, dental office, clean room  Industrial grade: food service, janitorial</td>
</tr>
<tr>
<td>5 - 6</td>
<td>medium</td>
<td>General purpose</td>
<td>General purpose, household, medical and industrial grade uses</td>
</tr>
<tr>
<td>7 - 8</td>
<td>heavy</td>
<td>Resistance to wear, tear, puncture, cut, greater chemical resistance</td>
<td>Industrial grade: janitorial, automotive, shop, chemical lab, medium chemical handling</td>
</tr>
</tbody>
</table>
| **Disposable gowns** | Provides clothing and skin protection; manufactured from variety of materials depending upon needed application. Non-surgical gowns are Class I devices (exempt from premarket review) intended to protect the wearer from the transfer of microorganisms and body fluids in low or minimal risk patient isolation situations. Non-surgical gowns are not worn during surgical procedures, invasive procedures, or when there is a medium to high risk of contamination. | FDA Medical Gowns  
AAMI PB70:2012 Liquid Barrier Performance And Classification Of Protective Apparel And Drapes In Health Care Facilities  
ASTM  
NFPA 1999 Standard on Protective Clothing and Ensembles for Emergency Medical Operations |
|-----------|-------------------------------------------------|----------------------------------|
| **Tyvek gown/coveralls** | Provides clothing and skin protection; tear resistant; protection from particulates. Some Tyvek clothing is coated for chemical resistance. | Strategies for Optimizing the Supply of Isolation Gowns: Use of coveralls may be used in healthcare settings as an alternative to gowns.  
NFPA 1999 Standard on Protective Clothing and Ensembles for Emergency Medical Operations |
| **Disposable lab coat** | Provides limited clothing and skin protection; tear resistant; protection from particulates. Some Tyvek clothing is coated for chemical resistance. | Biological hazards – ASTM F1670, ASTM F1671  
Liquid or chemical hazards – AATCC Method 42 and ASTM F903  
Physical hazards – NFPA 701 or 2112  
NIH Guidance for the Selection of Laboratory Coats |

**Abbreviations:**  
AAMI: Association for the Advancement of Medical Instrumentation  
AATCC: American Association of Textile Chemists and Colorists  
ASTM: American Society for Testing and Materials (ASTM International)  
FDA: Federal Drug Administration  
NFPA: National Fire Protection Association  
NIH: National Institutes for Health
### EYE AND FACE PROTECTION

<table>
<thead>
<tr>
<th>Item</th>
<th>Example</th>
<th>Description</th>
<th>Performance Standard</th>
</tr>
</thead>
</table>
| Safety glasses                            | ![Safety glasses](image) | Polycarbonate lens, side shields  
[Note: Personnel with corrective lenses will need “over-prescription” safety glasses or prescription safety glasses.] | Must meet [ANSI Z87.1](https://www.ehs.washington.edu) |
| Indirect vented                           | ![Indirect vented](image) | Provides eye protection from splash entry by vents that are hooded or covered | Must meet [ANSI Z87.1](https://www.ehs.washington.edu) |
| Goggles                                   | ![Goggles](image) | Provides eye protection against dust, mist, liquid and vapors              | Must meet [ANSI Z87.1](https://www.ehs.washington.edu) |
| Non-vented                                | ![Non-vented](image) | Provides eye protection against dust, mist, liquid and vapors              | Must meet [ANSI Z87.1](https://www.ehs.washington.edu) |
| Disposable medical face shield            | ![Disposable medical face shield](image) | Provides protection from splash, spray, spatter or droplets of blood or other potentially infectious materials | [Not ANSI Z87.1 compliant] |
| • Extend to ears                          | ![Disposable medical face shield](image) |                                                                 |                      |
| • Extend below chin                       | ![Disposable medical face shield](image) |                                                                 |                      |
| • Cover forehead                         | ![Disposable medical face shield](image) |                                                                 |                      |
| Face shield                               | ![Face shield](image) | Impact and chemical resistant face shield must be combined with safety glasses or goggles | Must meet [ANSI Z87.1](https://www.ehs.washington.edu) |

**ANSI**  American National Standards Institute  
**CDC**  Centers for Disease Control and Prevention
### FACEMASKS

<table>
<thead>
<tr>
<th>Item</th>
<th>Example</th>
<th>Description</th>
<th>Minimum Performance Standard</th>
</tr>
</thead>
</table>
| Cloth face covering       | ![Image]( Cloth face covering.png) | Not a respirator, surgical or procedure mask *(does not require fit testing)*; while not PPE, these act as a barrier and may protect persons nearby from wearer’s respiratory droplets (e.g., speaking, coughing, sneezing).  
  • Material varies; CDC states tightly woven cotton  
  • Should cover nose and mouth completely  
  • Fit snugly but comfortably against the side of the face  
  • Secured with ties or ear loops  
  • Multiple layers of fabric  
  • Allow for breathing without restriction  
  • Able to be laundered and machine dried without damage or change to shape | CDC Cloth Face Coverings |
| Surgical and medical/procedure masks | ![Image]( Surgical and medical/procedure masks.png) | Not a respirator *(does not require fit testing)*; provides a liquid barrier and protects the wearer against large droplets, splashes and/or aerosols. Protects persons nearby from the wearer’s respiratory emissions (e.g., speaking, coughing, sneezing).  
  Surgical and medical/procedure masks have different levels of protection:  
  Level 1 (low) barrier: General use for short procedures and exams that don't involve aerosols, spray or fluids.  
  Level 2 (moderate) barrier: For low to moderate levels of aerosols, spray and/or fluids.  
  Level 3 (maximum) barrier: For heavy levels of aerosols, spray and/or fluids. | ASTM F2100-11 (2011)  
  • Bacterial Filtration Efficiency  
  • Particulate Filtration Efficiency  
  • Fluid resistance  
  • Pressure differential  
  • ISO 10993-5, 10 Certification  
  FDA Cleared Product Search  
  FDA Manufacturing of Facemasks |
### RESPIRATORY PROTECTION

<table>
<thead>
<tr>
<th>Item</th>
<th>Example</th>
<th>Description</th>
<th>Performance Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust mask</td>
<td><img src="image" alt="Dust mask" /></td>
<td>Not a respirator; may protect against larger sized dust particles, fumes, mists, and microorganisms <em>(does not require fit testing).</em></td>
<td>Usually not NIOSH approved.</td>
</tr>
</tbody>
</table>
| N95 respirator | ![N95 respirator](image) | Protects against dusts, fumes, mists, and microorganisms including animal allergens. N95-Particulate Filter (95% filter efficiency level) is effective against particulate aerosols free of oil; time use restrictions may apply. Requires fit testing. | Must be at least 95% efficient in filtering 0.3 micron particles. *(P/R95, P/R/N99, and P/R/N100 also acceptable)*  
NIOSH-Approved  
NIOSH-Approved Surgical N95 Respirators *(provides moisture barrier)*  
*Strategies for Optimizing the Supply of N95 Respirators during COVID-19 Response*: Additional performance standards from other countries may be approved.  
Notes:  
Use caution when ordering N95 respirators due to recent issues with quality.  
NIOSH – Factors to consider when purchasing N95 respirators from another country.  
N95 with exhalation valve not preferred since exhaled breath passes outwards from person wearing N95. These should only be used in a clinical setting with a surgical mask on top. |
| Cartridge respirator | ![Cartridge respirator](image) | Protects against variety of particulates, vapors, dust, mists, fumes, or a | Must be NIOSH-Approved |

ASTM American Society for Testing and Materials (ASTM International),  
CDC Centers for Disease Control and Prevention
<table>
<thead>
<tr>
<th>Item</th>
<th>Example</th>
<th>Description</th>
<th>Performance Standard</th>
</tr>
</thead>
</table>
| Full face air-purifying elastomeric | ![Image](image1.png) | Similar to half-face, but with higher protection factor and greater protection of eyes and face; depends on filter or cartridge used. | **Must be NIOSH-Approved**

**Strategies for Optimizing the Supply of N95 Respirators during COVID-19 Response:** May be used if N95 filtering-facepiece respirators are not available. |
| Powered air-purifying respirator (PAPR) | ![Image](image2.png) | Powered air purifying respirator delivers steady supply of filtered air with loose fitting hood; can be used with HEPA filters and/or chemical cartridges. A variety of hoods/head covers are available for each unit. | **Must be NIOSH-Approved**

**Strategies for Optimizing the Supply of N95 Respirators during COVID-19 Response:** May be used if N95 filtering-facepiece or elastomeric respirators are not available. |

---

**CDC**  Centers for Disease Control and Prevention  
**HEPA**  High Efficiency Particulate Air  
**NIOSH**  National Institute for Occupational Safety and Health

---

**THERMOMETERS**
**Infrared thermometer**

Fever is one of the symptoms of COVID-19. A thermometer is useful in determining temperatures for screening purposes.

- A non-contact infrared thermometer is preferred.
- **ASTM E1965-98(2016)**
- Maximum error of ±0.5 °F

---

**Electronic Oral thermometer**

Fever is one of the symptoms of COVID-19. A thermometer is useful in determining temperatures for screening purposes.

- **ASTM E1112-00(2018)**
- Maximum error of ±0.2-0.5 °F

---

**Disposable Oral and forehead thermometer strips**

Fever is one of the symptoms of COVID-19. A thermometer is useful in determining temperatures for screening purposes.

- **ASTM E825-98**
- Maximum error of ±0.2-0.4 °F