

# 3 PERSONAL PROTECTIVE EQUIPMENT (PPE)

4  
5 NIST S 7101.21

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9

## 10 1. PURPOSE

11 This suborder establishes the safety requirements for personal protective equipment (PPE)  
12 necessary to protect NIST employees and covered associates from exposure to hazardous  
13 chemical, mechanical, biological, and other hazards at NIST. These are baseline  
14 requirements established by NIST. An OU may institute more stringent requirements for  
15 employees, associates, or visitors to their work areas. These additional OU-specific  
16 requirements are not included in this NIST-level document.  
17  
18

## 19 2. BACKGROUND

20 a. The PPE suborder supports the implementation of NIST S 7101.20: *Work and Worker*  
21 *Authorization Based on Hazard Reviews* (“Hazard Review”) when it is determined through  
22 the hazard-review process that PPE is necessary to protect the safety and health of employees  
23 and covered associates.  
24

25 b. NIST must meet or exceed the requirements established by the Occupational Safety and  
26 Health Administration (OSHA) in [29 CFR 1910.132](#), Personal Protective Equipment –  
27 General Requirements.  
28

29 (1) NIST has integrated the requirements of 29 CFR 1910.132(d), Hazard Assessment and  
30 Equipment Selection, and 29 CFR 1910.132(f), Training, into the Hazard Review  
31 suborder and fulfills those requirements through the implementation of that suborder.  
32

33 (2) NIST fulfills the remaining requirements of [29 CFR 1910.132](#) through the  
34 implementation of this suborder in conjunction with the Hazard Review suborder.  
35

36 c. NIST must meet or exceed the requirements established by OSHA in the following  
37 standards:

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<sup>1</sup> For revision history, see Appendix A.

- 38 (1) [29 CFR 1910.133](#), Eye and Face Protection;  
39  
40 (2) [29 CFR 1910.135](#), Head Protection;  
41  
42 (3) [29 CFR 1910.136](#), Foot Protection;  
43  
44 (4) [29 CFR 1910.137](#), Electrical Protective Equipment;  
45  
46 (5) [29 CFR 1910.138](#), Hand Protection;  
47  
48 (6) [29 CFR 1926.95](#), Criteria for Personal Protective Equipment;  
49  
50 (7) [29 CFR 1926.96](#), Occupational Foot Protection.  
51  
52 (8) [29 CFR 1926.100](#), Head Protection; and  
53  
54 (9) [29 CFR 1926.102](#), Eye and Face Protection;  
55

56 NIST fulfills these requirements through the implementation of this suborder in conjunction  
57 with the Hazard Review suborder.  
58

- 59 d. NIST must meet or exceed the requirements established by OSHA in [29 CFR 1910.134](#),  
60 Respiratory Protection. NIST fulfills those requirements through the implementation of the  
61 Respiratory Protection suborder in conjunction with the Hazard Review suborder.  
62  
63 e. NIST must meet or exceed the requirements established by OSHA in [29 CFR 1910.95](#),  
64 Occupational Noise Exposure and [29 CFR 1926.101](#), Hearing Protection. NIST fulfills those  
65 requirements through the implementation of the Hearing Protection suborder in conjunction  
66 with the Hazard Review suborder.  
67  
68 f. This suborder supersedes the following NIST Health and Safety Instructions (HSIs):  
69  
70 (1) HSI 11, Eye Protection Program, December 2004; and  
71  
72 (2) HSI 12, Foot Protection, September 1999.  
73  
74

### 75 3. APPLICABILITY

76 The provisions of this suborder apply to all NIST employees and covered associates engaged  
77 in activities in which they are required to, or voluntarily, use PPE.

78 **4. REFERENCES**

- 79 a. [29 CFR 1910.95](#), Occupational Noise Exposure  
80  
81 b. [29 CFR 1910.132](#), General Requirements;  
82  
83 c. [29 CFR 1910.133](#), Eye and Face Protection;  
84  
85 d. [29 CFR 1910.134](#), Respiratory Protection;  
86  
87 e. [29 CFR 1910.135](#), Head Protection;  
88  
89 f. [29 CFR 1910.136](#), Foot Protection;  
90  
91 g. [29 CFR 1910.137](#), Electrical Protective Equipment;  
92  
93 h. [29 CFR 1910.138](#), Hand Protection;  
94  
95 i. [29 CFR 1926.95](#), Criteria for Personal Protective Equipment;  
96  
97 j. [29 CFR 1926.96](#), Occupational Foot Protection;  
98  
99 k. [29 CFR 1926.100](#), Head Protection;  
100  
101 l. [29 CFR 1926.101](#), Hearing Protection;  
102  
103 m. [29 CFR 1926.102](#), Eye and Face Protection;  
104  
105 n. American National Standard, Occupational and Educational Eye and Face Protection, ANSI  
106 Z87.1-1989 (or more recent version);  
107  
108 o. American National Standard, Head Protection, ANSI Z89.1-1986 (or more recent version);  
109  
110 p. American National Standard, Anti-Vibration Gloves, ANSI S3.40 - 2002 / EN ISO 10819 (or  
111 more recent version);  
112  
113 q. American National Standard, Foot Protection, ANSI Z41.1-1991 (or more recent version);  
114  
115 r. ASTM International, Standard Specification for Performance Requirements for Foot  
116 Protection, ASTM F2413-18 (or more recent version).  
117

118 **5. APPLICABLE NIST OCCUPATIONAL SAFETY AND HEALTH SUBORDERS**

119 a. NIST S 7101.20: Work and Worker Authorization Based on Hazard Reviews

120

121 b. NIST S 7101.50: Biosafety

122

123 c. NIST S 7101.51: Bloodborne Pathogens

124

125 d. NIST S 7101.52: Cryogen Safety

126

127 e. NIST S 7101.54: Dispersible Engineered Nanomaterials (DENMs)

128

129 f. NIST S 7101.55: Hearing Protection

130

131 g. NIST S 7101.58: Respiratory Protection

132

133 h. NIST S 7101.60: Chemical Management

134

135 i. NIST S 7101.61: Compressed Gases Safety

136

137 j. NIST S 7101.64: Electrical Safety (in development)

138

139 k. NIST S 7101.65: Machines, Power Tools, and Associated Equipment Safety

140

141 l. NIST S 7101.67: Fall Protection

142

143 m. NIST S 7101.72: Laser Safety

144

145

146 **6. REQUIREMENTS**

147 a. Selection of Appropriate PPE

148

149 (1) Identification of appropriate PPE for an activity shall be part of a risk assessment  
150 methodology, *e.g.*, hazard review or job hazard analysis.<sup>2</sup>

151

152 (a) PPE shall be reconsidered during any re-review and re-approval of a hazard review or  
153 job hazard analysis.

154

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<sup>2</sup> The PPE Assessment Form (located on the PPE Program’s Tools webpage) may be used when conducting this assessment.

- 155 (2) When conducting a risk assessment activity, all other controls (*e.g.*, engineering,  
156 administrative, good work practices, *etc.*) shall be considered first to feasibly eliminate or  
157 reduce the need for PPE to the greatest extent.  
158
- 159 (a) PPE shall not be used as a substitute for other control measures or good work  
160 practices.  
161
- 162 (3) The use of selected PPE shall not create greater risks than those its use is intended to  
163 mitigate.  
164
- 165 (4) Selected PPE shall be of safe design and construction for the work to be performed.  
166
- 167 (5) Safety Program Specific PPE Requirements  
168 The following safety programs have specific PPE requirements:  
169
- 170 (a) NIST S 7101.50: *Biosafety*;  
171
- 172 (b) NIST S 7101.51: *Bloodborne Pathogens*;  
173
- 174 (c) NIST S 7101.52: *Cryogen Safety*;  
175
- 176 (d) NIST S 7101.54: *Dispersible Engineered Nanomaterials (DENMs)*;  
177
- 178 (e) NIST S 7101.55: *Hearing Protection*;  
179
- 180 (f) NIST S 7101.58: *Respiratory Protection*;  
181
- 182 (g) NIST S 7101.60: *Chemical Management*;  
183
- 184 (h) NIST S 7101.61: *Compressed Gas Safety*;  
185
- 186 (i) NIST S 7101.65: *Machines, Power Tools, and Associated Equipment Safety*;  
187
- 188 (j) NIST S 7101.64: *Electrical Safety*;  
189
- 190 (k) NIST S 7101.67: *Fall Protection*; and  
191
- 192 (l) NIST S 7101 72: *Laser Safety*.  
193

194 Please consult the relevant OSHE Safety Program Manager(s) or review the relevant  
195 suborder(s) for PPE requirements.

196

197 (6) General PPE Requirements for Body Parts

198

199 (a) Eye and Face Protection

200

201 i. Eye and face protection<sup>3</sup> shall meet the requirements of ANSI Z87.1.

202

203 ii. For potential flying-object hazards – Eye protection shall include side-  
204 protection. When detachable side protectors are employed, the combination of  
205 glasses and side protectors must be ANSI Z87.1 compliant.<sup>4</sup>

206

207 iii. For potential severe exposure to chemical splash hazards, flying fragments or  
208 objects, hot sparks from furnace operations, potential splash from molten  
209 metal, or extreme temperatures – A face shield in combination with primary  
210 safety eyewear, *i.e.*, goggles or safety glasses with side shields, shall be worn.

211

212 iv. For potential exposure to light radiation other than laser light,<sup>5</sup> filter lenses  
213 that have a shade number appropriate for the work being performed shall be  
214 worn; tinted and shaded lenses are not filter lenses unless they are marked or  
215 identified as such.

216

217 v. Prescription lenses, when used as, or in conjunction with, safety eyewear,  
218 must:

219

220 (i) Incorporate the prescription into safety eyewear meeting the  
221 requirements of ANSI Z87.1<sup>6</sup>; or

222

223 (ii) Be worn under ANSI Z87.1 safety eyewear without disturbing the  
224 proper position of the prescription lenses or the safety eyewear.

225

226 (b) Head Protection

227

228 i. Head protection shall meet the requirements of ANSI Z89.1.

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<sup>3</sup> ANSI Z87.1 does not apply to hazards related to X-rays, gamma rays, high-energy particulate radiation, microwaves, radio-frequency radiation, or work with lasers and masers. Information on PPE required for work involving these hazards is available in other OSH programs.

<sup>4</sup> Uncertified prescription or non-prescription glasses are not acceptable when eye protection is required.

<sup>5</sup> For protection from laser light, refer to [Health and Safety Instruction 13, Laser Safety](#).

<sup>6</sup> Form NIST 293S shall be used to request prescription safety eyewear through NIST.

- 229           ii.    Head protection shall be worn in designated areas where there is a potential  
230           for:  
231  
232               (i)    A head injury caused by falling objects or impact; or  
233  
234               (ii)   Electrical shock due to working near exposed electrical conductors  
235               that could come in contact with the head.  
236  
237           iii.   If head protection is required to be worn by those working above other work  
238           levels, chinstraps designed to prevent them from being bumped off the  
239           worker's head should be utilized. Chinstraps shall not be so strong as to  
240           present a strangulation hazard.  
241  
242           iv.    Bump caps may be used when head protection is not required but a worker  
243           may be exposed to minor head bumps or laceration hazards. Bump caps are  
244           not approved for use where impact protection is required.  
245

246           (c) Foot Protection  
247

- 248           i.    Foot protection<sup>7</sup> meeting the requirements of ASTM F-2413-18 must be worn  
249           when working in areas where there is a danger of foot injury due to hazards  
250           such as falling or rolling objects, objects piercing the sole, or electrical  
251           hazards.  
252  
253           ii.   Shoes resistant to permeation shall be worn at all times in spaces where there  
254           is a reasonable likelihood that feet could be exposed to chemicals or materials  
255           hazardous to the feet, e.g., toxic chemicals, strong acids or bases, or  
256           biohazardous materials.  
257  
258           iii.   Perforated shoes, open-toed shoes, sandals, and cloth sneakers shall not be  
259           worn in work areas when a more substantial barrier is required to protect  
260           workers from surrounding hazards.  
261  
262           iv.   Chemical resistant overshoes or boots may be used to avoid possible  
263           exposures to corrosive chemicals or large quantities of solvents or solutions  
264           that might penetrate normal footwear, e.g., during spill cleanup.  
265  
266           v.    Workers who, for medical reasons, cannot wear required safety shoes, must,  
267           upon request, furnish a letter to their supervisor from their physician stating

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<sup>7</sup> Form NIST 395 shall be used to request protective footwear through NIST.

268 the medical reasons and the anticipated duration of the medical condition.  
269 Appropriate accommodations shall be provided.

270  
271 (d) Hand Protection

272  
273 i. Hand protection should be worn when there is the potential for a hand injury  
274 from chemical, biological, cutting, piercing, electrical, or other hazards.

275  
276 (i) Use of hand protection shall only be excluded as a result of a risk  
277 assessment methodology (e.g., hazard review, job hazard analysis).  
278 Specific activities where this may be applicable include, but are not  
279 limited to:

280  
281 [i] Working with machines such as lathes and drill presses; or

282  
283 [ii] Working with cryogenic liquids.

284  
285 ii. When working with harmful substances that can be absorbed through the skin  
286 or that can cause skin irritation, chemical burns, or similar conditions, the  
287 following should be considered as part of the risk assessment methodology:

288  
289 (i) Consulting the Safety Data Sheet (SDS) or other product information;  
290 and

291  
292 (ii) Reviewing the manufacturer's glove selection guide.<sup>89</sup>

293  
294 (e) Body Protection

295  
296 i. Body protection shall be provided for workers who may be exposed to bodily  
297 injury from hazards including, but not limited to:

298  
299 (i) Exposure to intense heat or cold (excluding cold weather clothing,  
300 which is not covered by this suborder);

301  
302 (ii) Splashes of very cold or very hot metals or liquids;

303  
304 (iii) Impacts from tools, machinery, or materials;

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<sup>8</sup> When selecting chemical resistant gloves, consider their performance needs, condition and duration of use, hazards, glove thickness, and permeation rate.

<sup>9</sup> An example of a glove selection guide is the [Ansell Chemical Resistance Guide](#).

- 305 (iv) Contact with equipment that could result in cuts or abrasion;  
306  
307 (v) Exposure to hazardous chemicals;  
308  
309 (vi) Contact with potentially infectious materials; and  
310  
311 (vii) Exposure to electrical arc hazards.  
312
- 313 ii. Consideration should also be given to garments worn underneath PPE to help  
314 provide additional protection against chemical contamination, *e.g.*, wearing a  
315 “T” shirt instead of a tank top or jeans without large holes when working with  
316 chemicals, wearing clothes made of cotton instead of polyester when working  
317 with flames or there is danger of fire/explosion, *etc.*  
318
- 319 iii. High-visibility safety apparel, meeting the requirements of ISEA/ANSI 107,  
320 shall be worn by workers exposed to the hazards of moving roadway traffic or  
321 construction equipment.  
322
- 323 b. Use of PPE  
324
- 325 (1) PPE should be distributed for individual use whenever practical.  
326
- 327 (2) Single-use PPE (*e.g.*, disposable nitrile gloves) shall not be reused.  
328
- 329 (3) PPE shall not be shared among employees and covered associates until it has been  
330 properly cleaned and sanitized as necessary based on the type of PPE.  
331
- 332 (4) Individuals required to wear PPE shall demonstrate an understanding of the following  
333 prior to first use of the PPE:  
334
- 335 (a) Steps to properly inspect PPE (please see **Section 6.c**);  
336
- 337 (b) Proper donning of PPE;  
338
- 339 (c) Proper doffing of PPE;  
340
- 341 (d) Steps to properly maintain PPE;  
342
- 343 (e) Steps to properly store PPE; and  
344

- 345 (f) Steps to properly dispose of contaminated PPE.  
346  
347 (5) Prior to each use, PPE shall be inspected (please see **Section 6.c**).  
348  
349 (6) PPE shall be worn properly at times required by the hazard review or job hazard analysis.  
350  
351 (7) PPE that is contaminated or suspected of being contaminated with hazardous substances  
352 (chemical, biohazardous, or DENMs) shall not be worn outside of the work area or  
353 laboratory (see Section 6.e for proper disposal procedures).  
354

355 c. Inspection

- 356  
357 (1) PPE shall be inspected according to manufacturer's instructions for signs that the  
358 integrity of the PPE may be compromised. Examples include, but are not limited to:  
359  
360 (a) Defects;  
361  
362 (b) Damage;  
363  
364 (c) Wear;  
365  
366 (d) Contamination; and  
367  
368 (e) Expiration date.  
369  
370 (2) PPE showing signs that the integrity of the PPE may be compromised shall:  
371  
372 (a) Not be used; and  
373  
374 (b) Disposed of according to proper procedures.  
375  
376 (3) Contaminated PPE that does not show signs of compromised integrity may be reused if it  
377 can be appropriately decontaminated.  
378  
379 (a) Single-use PPE shall not be reused under any condition.  
380  
381 d. Care, Maintenance, and Storage of PPE  
382  
383 (1) PPE shall be cleaned, maintained, and stored in accordance with manufacturers'  
384 instructions.

385 e. Disposal of PPE

386

387 (1) PPE contaminated with a chemical regulated as a hazardous waste as defined in 40 CFR  
388 261 shall be disposed as hazardous waste. Please see Appendix B for examples, with  
389 exceptions for evaporated solvents as indicated below in Section 6.e(1)(b).

390

391 (a) Chemical-contaminated PPE shall be:

392

393 i. Contained in a sealable plastic bag or other appropriate/compatible container;  
394 and

395

396 ii. Labeled as hazardous waste indicating the contaminants to which the PPE has  
397 been exposed.

398

399 (b) PPE exposed to solvents that evaporate from the PPE during use or immediately  
400 following use may be placed in the regular trash. Examples include:

401

402 i. Acetone;

403 ii. Cyclohexanol;

404 iii. Ethyl Acetate;

405 iv. Ethyl Benzene;

406 v. Ethyl Ether;

407 vi. Methanol;

408 vii. Methyl Isobutyl Ketone;

409 viii. N-Butyl Alcohol (2-Butanol);

410 ix. Xylene;

411 x. Ethanol; and

412 xi. Isopropanol.

413

414 No saturated materials or free liquid may be placed in the trash.

415

416 (2) PPE contaminated with DENMs shall be disposed as hazardous waste.

417

418 (a) DENMs-contaminated PPE shall be:

419

420 i. Contained in a sealable plastic bag or other appropriate/compatible container;  
421 and

422

423 ii. Labeled as hazardous waste indicating the contaminants to which the PPE has  
424 been exposed.

425 (3) PPE contaminated with a biohazardous material shall be disposed as biohazardous waste  
426 as per the requirements of NIST S 7101.50: *Biosafety* and NIST S 7101.51: *Bloodborne*  
427 *Pathogens*.

428  
429 (a) PPE generated from janitorial activities are not collected as biohazardous waste  
430 unless the PPE is contaminated with visible blood or due to the known or suspected  
431 presence of an infectious agent capable of causing disease.

432  
433 (4) PPE exposed to gases or cryogens may be disposed in regular trash.

434  
435 (5) PPE which has no known or suspected exposure to hazardous chemicals, biohazardous  
436 materials, or DENMs may be disposed with regular trash.

437  
438 f. Training

439  
440 (1) Training shall be provided, documented, and recorded in accordance with the  
441 requirements of NIST S 7101.23: *Safety Education and Training*.

442  
443 (2) Employees and covered associates who are to engage in activities in which they use PPE  
444 shall complete:

445  
446 (a) The training provided by OSHE on the PPE program; and

447  
448 (b) The activity-specific training, provided by the OUs, required by applicable hazard  
449 reviews.

450  
451 (3) Official First-Level Supervisors of employees and covered associates engaged in  
452 activities in which they use PPE shall complete the training provided by OSHE on the  
453 PPE program.

454  
455 (4) Retraining

456  
457 (a) Employees and covered associates who have already been trained shall complete  
458 retraining identified by the OUs whenever there is reason to believe that employees or  
459 covered associates do not have the understanding and skill necessary to use, care for,  
460 maintain, and dispose of PPE properly. Circumstances where retraining is required  
461 include, but are not limited to:

462  
463 i. Changes in the assigned responsibilities or duties, workplace, process,  
464 hazards, or the type of PPE to be used, render previous training obsolete; or

465                   ii. Inadequacies in an employee's or associate's knowledge or use of assigned  
466                   PPE indicate that the employee or associate has not retained the necessary  
467                   understanding or skill.

468

469 g. Payment for Personal Protective Equipment

470

471       (1) PPE used to comply with the requirements of this and other applicable OSH suborders  
472       shall be provided by the OUs at no cost to employees or covered associates.<sup>10,11</sup>

473

474       (a) OUs are not obligated to, but may, provide the following items to NIST employees  
475       and covered associates if the items are required by an approved hazard review and  
476       acquired in accordance with federal acquisition regulations:

477

478           i. Everyday clothing, such as long-sleeve shirts, long pants, street shoes, and normal  
479           work shoes or boots;

480

481           ii. Weather-protection gear such as winter coats, jackets, gloves, parkas, rubber  
482           boots, hats, raincoats, and ordinary sunglasses; and

483

484           iii. Protective skin creams, including sunscreen; insect repellent; and similar items.

485

486       (2) Replacement PPE shall be provided by the OUs at no cost to employees and covered  
487       associates except when employees or covered associates have lost or intentionally  
488       damaged the PPE.

489

490       (3) NIST *may* use appropriated funds to purchase *individual-specific* PPE (see definition in  
491       Section 7) for NIST employees under the following conditions:

492

493       (a) The individual-specific PPE must be special and not part of the ordinary and usual  
494       furnishings an employee may reasonably be expected to provide for themselves;

495

496       (b) The provision of individual-specific PPE, as opposed to available generic PPE  
497       alternatives to individual-specific PPE, must be for the benefit of the government; and

498

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<sup>10</sup> This obligation only requires payment for PPE. It does not require payment for uniforms, caps, or other clothing worn solely to identify a person as an employee or associate. This obligation does not require payment for items worn to keep employees and covered associates clean for purposes unrelated to safety or health, e.g., coveralls, aprons, or other apparel when worn solely to prevent clothing or skin from becoming soiled, or clothing that is personal in nature and is worn as much off the job as on the job.

<sup>11</sup> Employees covered under collective bargaining agreements may have negotiated payment for specific PPE. This suborder does not override those agreements.

- 499 (c) The employee must be engaged in hazardous duty.  
500  
501 Any individual-specific PPE purchased by NIST for employees is and remains the  
502 property of the government, not the employees.  
503  
504 (4) NIST *may not* use appropriated funds to purchase individual-specific PPE for any  
505 individual who is not a NIST employee.  
506  
507 (5) NIST *may* provide generic PPE for covered associates. This is PPE which can be worn  
508 by anyone and must either remain at NIST or be disposable. Examples of generic PPE<sup>12</sup>  
509 include, but are not limited to:  
510  
511 (a) Hard hats;  
512  
513 (b) Non-prescription safety glasses, safety goggles, laser safety glasses, and face shields;  
514  
515 (c) Ear plugs or earmuffs;  
516  
517 (d) Disposable dust masks and N95 respirators for voluntary use;  
518  
519 (e) Lab jackets;  
520  
521 (f) Disposable gloves (e.g., neoprene or nitrile), insulated gloves for handling cryogenics,  
522 and leather work gloves; and  
523  
524 (g) OSHA toes shoe covers.  
525  
526

## 527 7. DEFINITIONS

- 528 a. Appropriated Funds – Funds made available to a Federal agency as a result of an act of  
529 Congress that permits the agency to incur obligations and to make payments out of the U.S.  
530 Department of the Treasury for *specified purposes*.  
531  
532 b. Biohazardous Material – A biological material or agent that presents potential risk to the  
533 health of humans or other organisms either directly through infection or indirectly through  
534 damage to the environment. Biohazards include, but are not limited to, bacteria; fungi;  
535 viruses; parasites; rickettsia; biological toxins; prions; non-human mammalian cell lines and  
536 tissues; human specimens such as human blood, serum, plasma, blood products, primary and  
537 continuous human cell lines, unfixed human tissues, fecal materials, semen, vaginal

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<sup>12</sup> Please contact OSHE with additional questions related to what constitutes generic PPE.

538 secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid,  
539 amniotic fluid, saliva, tears, sweat, breast milk, and urine; and recombinant DNA materials  
540 such as inserts or vectors that are known to express toxins, oncogenes, and/or virulent  
541 factors.

542  
543 Non-toxic proteins and commercially available enzymes, cell culture medium and  
544 supplements, reagents such as monoclonal antibodies, and random DNA base pairs are not  
545 considered biohazards.

546  
547 c. Bump Caps – Head protection voluntarily worn to reduce exposure to lacerations and  
548 abrasions caused by minor bumps to the head.

549  
550 d. Hazardous Waste – Waste with properties that make it dangerous or capable of having a  
551 harmful effect on human health or the environment.

552  
553 Hazardous wastes are defined under the Resource Conservation and Recovery Act  
554 Regulations in 40 CFR 261 where they are divided into two major categories: characteristic  
555 wastes and listed wastes.

556  
557 Characteristic hazardous wastes are materials that are known or tested to exhibit one or more  
558 of the following four hazardous traits:

- 559  
560 (1) Ignitability;  
561 (2) Reactivity;  
562 (3) Corrosivity; and  
563 (4) Toxicity.

564  
565 Listed hazardous wastes are materials specifically listed by regulatory authorities and include  
566 discarded chemical products.

567  
568 For general laboratory chemicals, assume they will be hazardous wastes when disposed  
569 unless you have specific information from an SDS or other resource that confirms that a  
570 chemical is non-hazardous. Contact NIST OSHE (x5375, option 3) with any questions  
571 (examples of hazardous wastes are included in Appendix B).

572  
573 e. DENMS – Intentionally-produced materials with one or more dimensions between  
574 approximately 1 nanometer (nm) and 100 nm that can be dispersed into (or onto) liquid or  
575 solid compounds or aerosolized (suspended in a gas).

576

- 577 f. Employee – An individual employed by NIST who has been issued a NIST employee  
578 badge.<sup>13</sup>  
579
- 580 g. Generic PPE – PPE not dedicated or designed solely for the use of a single individual,  
581 including, but not limited to, latex gloves; lab coats or jackets; non-prescription safety  
582 eyewear, including safety eyewear to be worn over prescription eyewear; disposable ear  
583 plugs; ear muffs; and disposable coveralls.  
584
- 585 h. Individual-specific PPE – PPE designed solely for the use of a single individual, including,  
586 but not limited to, prescription eyewear, custom-fitted safety shoes, and custom-designed  
587 fitted ear plugs.  
588
- 589 i. Personal Protective Equipment (PPE) – Protective equipment used to reduce an individual’s  
590 exposure to hazards when engineering and administrative controls are not feasible or  
591 effective on their own in reducing exposures to acceptable levels.  
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## 594 **8. ACRONYMS**

- 595 a. ANSI – American National Standards Institute  
596
- 597 b. CFR – Code of Federal Regulations  
598
- 599 c. OSH – Occupational Safety and Health  
600
- 601 d. OSHE – Office of Safety, Health, and Environment  
602
- 603 e. OU – Organizational Unit  
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- 605 f. PPE – Personal Protective Equipment  
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- 607 g. SDS – Safety Data Sheet  
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<sup>13</sup> Technically, a “NIST employee” is defined as follows: The NIST Director or an individual who is (a) appointed in the civil service by an employee acting in an official capacity, (b) engaged in the performance of a Federal function under authority of law or an Executive act, and (c) subject to the supervision of the NIST Director or an individual named by paragraph (a) while engaged in the performance of the duties of his position (see 5 U.S. Code § 2105).

613 **9. ROLES AND RESPONSIBILITIES**

614 a. Employees and Covered Associates Engaged in Activities in which They Are Required to, or  
615 Voluntarily, Use PPE:

616  
617 (1) Complete the training specified in Section 6.f as assigned to them by their Official First-  
618 Level Supervisors;

619  
620 (2) Use, inspect, clean, maintain, and dispose of the PPE provided to them, or that they own,  
621 in accordance with the requirements in Section 6.b, 6.c, 6.d, and 6.e, as applicable, and  
622 their training; and

623  
624 (3) Request additional training as duties change or as otherwise needed.

625  
626 b. First-Level Supervisors of Employees and Covered Associates Engaged in Activities in  
627 which They Are Required to, or Voluntarily, Use PPE:

628  
629 (1) Ensure that affected employees and covered associates they supervise are provided with,  
630 or own, the PPE necessary to comply with the requirements of this and other applicable  
631 OSH suborders, at no cost to affected employees and covered associates;

632 (2) Assign training to the affected employees and covered associates they supervise in  
633 accordance with the requirements in Section 6.f and do so when:

634  
635 (a) Employees and covered associates enter on duty;

636  
637 (b) Employees' or covered associates' duties change; and

638  
639 (c) Special circumstances arise such as those indicated in Section 6.f(4)(a);

640  
641 (3) Ensure that the training specified in Sections 6.f(2)(b) and 6.f(4)(a) is documented and  
642 recorded in accordance with OU procedures;

643  
644 (4) Complete the training specified in Section 6.f(3) for Official First-Level Supervisors, and

645  
646 (5) Ensure that an individual knows how to properly inspect, use, and dispose of PPE prior to  
647 first use.

648  
649 c. OSHE PPE Program Manager:

650  
651 (1) Ensure that training on the PPE program is available and meets the format, content, and  
652 documentation requirements of the Safety Education and Training suborder.

653 **10. AUTHORITIES**

654 a. First-Level Supervisors of Employees and Covered Associates Engaged in Activities in  
655 which They Are Required to Use PPE:

656

657 (1) Approve, or disapprove, requests to purchase individual-specific PPE when the  
658 conditions specified in Section 6.g(3) are satisfied.

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661 **11. DIRECTIVE OWNER**

662 Chief Safety Officer

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665 **12. APPENDICES**

666 A. Revision History

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668 B. Examples of chemicals regulated as hazardous waste per 40 CFR 261.

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### Appendix A. Revision History

Version No.	Approval Date	Effective Date	Brief Description of Change; Rationale
1	04/29/14	04/01/15	None – Initial document
2	11/13/15	11/13/15	<ul style="list-style-type: none"> <li>• Made suborder applicable to “associates”.</li> <li>• Revised Section 6d(1)(a) from “The following protective equipment is excepted from this requirement” to “OUs are not obligated to, but may, provide the following items to NIST employees and associates if the items are required by an approved hazard review and acquired in accordance with federal acquisition regulations.” This change allows OFPM to purchase, in accordance with the Federal Acquisition Regulation, sunscreen and similar items for workers whose jobs warrant them.</li> </ul>
3	08/14/18	04/01/20	<ul style="list-style-type: none"> <li>• Globally revised document specifying “covered” associates.</li> <li>• Revised Section 5 to include specific NIST suborders that are applicable.</li> <li>• Revised and reorganized Section 6 to address the following:               <ul style="list-style-type: none"> <li>– PPE shall be part of the hazard review and re-review processes;</li> <li>– PPE shall be considered only after all other appropriate control measures are implemented;</li> <li>– Suborders that have specific PPE requirements are identified;</li> <li>– PPE shall be worn appropriately during identified times;</li> <li>– PPE shall be inspected; and</li> <li>– Contaminated and non-contaminated PPE shall be disposed appropriately.</li> </ul> </li> <li>• Revised Section 7 to include new definitions found in the revised Section 6.</li> <li>• Added Appendix B.</li> </ul>

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### Appendix A. Revision History (continued)

Version No.	Approval Date	Effective Date	Brief Description of Change; Rationale
4	06/19/19	04/01/20	<ul style="list-style-type: none"><li>Revised Section 6 to indicate that high-visibility safety apparel, meeting the requirements of ISEA/ANSI 107, <u>shall</u> be worn by workers exposed to the hazards of moving roadway traffic or construction equipment.</li></ul>
5	01/04/2021	01/04/2021	<ul style="list-style-type: none"><li>Modified reference in two places from “ASTM F2413-2005” to “ASTM F2413-18”.</li></ul>
6	01/5/21	01/05/21	<ul style="list-style-type: none"><li>Updated suborder links.</li></ul>
7	06/20/23	06/20/23	<ul style="list-style-type: none"><li>Section 6.g(5) was added to clearly indicate what generic PPE can be provided to associates.</li></ul>

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## Appendix B

Examples of chemicals regulated as hazardous waste per 40 CFR 261.

- **Halogenated hydrocarbon**, such as Trichloroethylene, Dichloromethane, Chloroform, Chlorobenzene, and Tetrachloroethylene.
- **Non-halogenated hydrocarbons**, such as Methanol, Ethanol, Acetone, Cyclohexane, Acetonitrile, Toluene, Benzene, and Tetrahydrofuran.
- **Inorganic Acids** (concentrated, dilute and in mixtures) including Hydrochloric, Sulfuric, Hydrofluoric, Nitric, Perchloric, and Chromic.
- **Inorganic Bases** (concentrated, dilute and in mixtures), including Ammonium Hydroxide and Sodium Hydroxide.
- **Organic Bases**, including Aniline and Dimethylamine.
- **Organic acids**, including Acetic and Formic acid.
- **Heavy Metals** including Lead, Cadmium, Sodium and Potassium.
- **Mercury contaminated materials** including broken mercury thermometers, emptied mercury contaminated bottles, vacuum lines, glassware, manometers, barometers, mercury light bulbs, mercury switches, mercury thermostats and mercury electrical apparatus.
- **Oxidizers** including Ammonium Nitrate, Calcium Hypochlorite, Hydrogen Peroxide.
- **Polychlorinated biphenyls (PCBs)** including PCB fluorescent lighting ballasts, PCB containing chemicals, PCB contaminated transformer oils, PCB contaminated solvents, and PCB contaminated debris.
- **Degreasing solutions** including, 1, 1, 1-Trichloroethene and mineral spirits.
- **Paint shop wastes**, including mixtures of paint (water based, alcohol, or oil-based paints) with varsol, paint thinners, or paint strippers.
- **Electroplating wastes** including Cobalt (II) chloride, Cobalt (II) sulfate, Chromium (II) chloride, Phosphoric acid, Boric acid, Nickel sulfamate, and Tin Fluoroborate.
- **Pesticides** – herbicides, insecticides, fungicides.