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CONSUMER PRODUCT SAFETY COMMISSION

[Docket No. CPSC-2024-0030]

Notice of Availability: Public Playground Safety Handbook Update

AGENCY: Consumer Product Safety Commission.

ACTION: Notice of availability.

SUMMARY: The U.S. Consumer Product Safety Commission (Commission or CPSC) is announcing the availability of final updates to its Public Playground Safety Handbook.

ADDRESSES: *Docket:* For access to the docket to read background documents or comments received, go to: https://www.regulations.gov, and insert the docket number, CPSC-2024-0030, into the "Search" box, and follow the prompts.

FOR FURTHER INFORMATION CONTACT: Daniel Taxier, Children's Program Manager, Division of Mechanical and Combustion Engineering, U.S. Consumer Product Safety Commission, 5 Research Place, Rockville, MD 20850–3213; email: dtaxier@cpsc.gov; telephone: (301) 987-2211.

SUPPLEMENTARY INFORMATION:

I. Introduction and Background

CPSC's playground handbook (Handbook) is intended to provide information about playground safety to childcare personnel, school officials, parks and recreation personnel, equipment purchasers and installers, playground designers, and any other members of the general public (*e.g.*, parents and school groups) concerned with playground safety and interested in evaluating their respective playgrounds. The Handbook also includes references to voluntary standards that contain technical requirements that are primarily intended for use by equipment designers and manufacturers, architects, and any others requiring more technical information.

The Handbook is not a rule and does not establish legally enforceable responsibilities.

The Commission published the first Handbook for Public Playground Safety (the Handbook) in 1981. This original document was a two-volume set containing technical information intended to reduce deaths and injuries to children associated with playground equipment. In 1991, the Handbook was revised to a single volume, which contained recommendations based on a COMSIS Corporation report to the CPSC (COMSIS Human Factors Report).[1] Also in 1991, the first ASTM International (ASTM) standard for playground safety, F1292: *Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment*, was published. In 1993, ASTM F1487: *Standard Consumer Safety Performance Specification for Playground Equipment for Public Use* was published. CPSC published minor revisions to the Handbook in 1994. In 1997, the Handbook was updated based on ASTM F1487, a playground safety roundtable meeting held in October of 1996, and comments received in response to a May 1997 CPSC request.

Due to the lack of a Commission quorum at the time, 2008 revisions to the Handbook were released as a draft staff document. Later in 2008, members of ASTM's voluntary standards committee on playground equipment and the International Play Equipment Manufacturers Association (IPEMA) identified areas where the voluntary standards and the Handbook did not align. In 2010, CPSC published a revised Handbook that resolved many of these issues.

Since 2010, ASTM has published new and revised public playground standards,[2] and new materials and equipment have been installed in playgrounds. Additionally, members of ASTM,

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[1] The 1990 COMSIS report, *Development of Human Factors Criteria for Playground Equipment Safety*, is available in six parts on the CPSC website. Part 1 is available at: https://www.cpsc.gov/content/Development-of-Human-Factors-Criteria-for-Playground-Equipment-Safety-Part-1. Part 2 is available at: https://www.cpsc.gov/content/Development-of-Human-Factors-Criteria-for-Playground-Equipment-Safety-Part-2. Part 3 is available at: https://www.cpsc.gov/content/Development-of-Human-Factors-Criteria-for-Playground-Equipment-Safety-Part-3. Part 4 is available at: https://www.cpsc.gov/content/development-human-factors-criteria-playground-equipment-safety-part-4. Part 5 is available at: https://www.cpsc.gov/content/Development-of-Human-Factors-Criteria-for-Playground-Equipment-Safety-Part-5. Part 6 is available at: https://www.cpsc.gov/content/development-human-factors-criteria-playground-equipment-safety-part-6.

[2] *See* section 1.4.1 of the Handbook for a list of relevant standards.

the National Program for Playground Safety (NPPS), IPEMA, and members of the general public have requested clarifications and recommended an update to the Handbook.

Based on the current editions of the relevant ASTM standards, feedback from the public, and comments from ASTM and NPPS, CPSC published a revised draft Handbook with a focus on improvements to safety. The draft changes included updates relating to: 1) signage and labeling; 2) common hazards for supervisor awareness; 3) new impact attenuation testing for suspended elements in ASTM F1487; 4) an updated warning label on potential strangulation hazards; 5) safety recommendations concerning merry-go-rounds and other spinning equipment, consistent with requirements in ASTM F1487; and 6) several other minor revisions and corrections.

On October 1, 2024, CPSC published a Notice of Availability (NOA) in the *Federal Register* that presented its draft updates to the Playground Handbook. 89 FR 79901. The comment period closed on December 2, 2024. CPSC received 37 public comments.

II. Summary of the Final Updates to the Playground Handbook

The 2025 Handbook includes changes from the 2024 draft Handbook, and additional revisions made in response to public comments on the NOA.[3] The staff memorandum accompanying the Handbook, available at https://www.cpsc.gov/content/Ballot-Vote-Notice-of-Availability-Public-Playground-Safety-Handbook-Update, summarizes major revisions included in the final edition. The final edition contains the updates described above in the 2024 draft Handbook, with revisions made in response to public comments, which are addressed in Section III below.

The updated and final Handbook is available on the Commission's website at: https://www.cpsc.gov/safety-education/safety-guides/playgrounds/public-playground-safety-handbook, and from the Commission's Office of the Secretary, Consumer Product Safety Commission, 4330 East-West Highway, Bethesda, MD 20814; telephone: (301) 504-7479.

[3] On August 5, 2025, the Commission voted (2-0) to publish this notice.

III. Response to Public Comments

CPSC received thirty-seven public comments on the draft updates to its Handbook, in response to the NOA. This section summarizes those comments and provides the Commission's responses.

A. General Comments on Technical Handbook Content (Various Sections)

Comment: Blue Imp Recreational Products, IPEMA, and a safety consultant commented that the technical information in the playground handbook is not of value to the audience, primarily the consumer. The commenters added that when CPSC and ASTM technical requirements are in conflict, it causes confusion in the marketplace. Another safety consultant stated that references to ASTM standards for technical content on signage are not helpful because consumers must pay for access to the standards.

Response: The Commission disagrees with the commenters that the technical information in the Handbook is not valuable to the intended audience. As described in section 1.2 of the Handbook, the intended audience includes childcare personnel, school officials, parks and recreation personnel, equipment purchasers and installers, playground designers, and any other members of the general public (*e.g.*, parents and school groups) concerned with public playground safety and interested in evaluating their respective playgrounds. References to voluntary standards that contain technical requirements are primarily intended for use by equipment designers and manufacturers, architects, and any others requiring more technical information. Professionals generally have the ability to access the ASTM standards through their organizations and therefore can benefit both from the Handbook and the ASTM standards to see an explanation of the hazards and the steps that should be taken to mitigate those hazards. Non-technical audiences, including the general public, will benefit from the explanation of information in the Handbook, but likely do not require access to the technical information in the ASTM standards. In addition, free, read-only copies of some ASTM standards are available for viewing on the ASTM website at https://www.astm.org/READINGLIBRARY/.

The Commission acknowledges that there are some technical requirements in the Handbook that are not consistent with the ASTM standards. In this case, the Commission concludes that the recommendations in the Handbook provide a greater level of safety than a similar requirement in the ASTM standards. The Commission revisits these differences and the available safety information during each update process to determine whether conflicts can be resolved without reducing safety.

Every Handbook update balances technical and non-technical safety information, and in this instance, the Commission concludes that a reference to ASTM standards for technical content on signage is adequate because the general public are not responsible for designing playground signage. The Commission also notes that the Playground Handbook section on signage and labeling (section 2.2.6) refers to ASTM1487, *Standard Consumer Safety Performance Specification for Playground Equipment for Public Use*, and ASTM has made a free, read-only copy of this standard available viewing at https://www.astm.org/READINGLIBRARY/.

B. Photos (Various Sections)

Comment: NPPAS and IPEMA identified photographs on the front and rear cover of the Handbook and in section 2.2.7 and noted that the equipment shown does not follow recommendations in the Handbook or the requirements of ASTM standards. The commenters identified that the photographs included a slide that lacked a chute or hood at the top, an opening in a net climber that appeared to be an entrapment hazard, and a photo of a bucket swing that appeared to have a leg opening that is too large. Additionally, NPPAS recommended that pictures be consistent with having children or not having children present.

Response: The Commission thanks the commenters for their feedback and has changed the referenced photographs in the Handbook. The Commission intends for the Handbook to depict playground equipment both in and out-of-use by children to allow readers to see the equipment

in various contexts, therefore, photographs were not changed to either have children or not have children present.

C. ASTM Standards References (Section 1.4)

Comment: Three commenters, NPPAS, an ASTM standard technical contact, and IPEMA, recommended general changes to the Handbook's references to ASTM standards. NPPAS recommended adding a brief description of ASTM in section 1.4 and moving all the bullet details and listing of standards to an appendix. The technical contact for ASTM F1292 *Standard Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment*, stated that ASTM F3351 *Standard Test Method for Playground Surface Impact Testing in Laboratory at Specified Test Height* will be incorporated into ASTM F1292 in 2025 and recommended not to include ASTM F3351 in the new Handbook. IPEMA recommended providing a reference to the ASTM F1487 standard rather than the specific sections, as section numbers may change in future revisions.

Response: The Commission lacks the resources to edit and reorganize the references in the Handbook as requested by NPPAS at this time but will consider them in future revisions. ASTM F3351 is only referenced once, with respect to laboratory testing; the testing is intended to provide more information to the manufacturer or owner/operator of the surface, rather than to meet a performance requirement; and the standard is likely to be incorporated into ASTM F1292. Therefore, the Commission agrees to remove the listing of ASTM F3351 in section 1.4 and the reference in section 2.4.

The Commission agrees that referenced section numbers could change but concludes that a simple reference to an ASTM standard would not be appropriate in all cases. Section numbers are replaced with section subjects, where applicable, to facilitate the public's ability to find the appropriate section.

D. Injury Data (Section 1.7)

Comment: IPEMA and Ape Studio commented that the reported incident data should be limited to public playgrounds only and should not include home playgrounds because it misrepresents the hazards of public playgrounds. IPEMA added that the reported emergency room-treated injuries from 2021-2023 are not sourced from a CPSC published document and are therefore difficult to verify.

Response: The Commission disagrees that the inclusion of all playground equipment-related incidents is misrepresentative of the hazard because home playgrounds and public playgrounds share common hazard patterns. Furthermore, because the location categories in the data do not delineate public playgrounds, the Commission concludes that attempting to report only public playground data would be overly burdensome.

The Commission confirms that the report of an average of over 190,000 estimated emergency room-treated injuries annually from 2021-2023 includes all playground equipment, including both home playgrounds and public playgrounds, and is based on publicly available data in the National Electronic Injury Surveillance System (NEISS).[4] This report is consistent with how incident data were analyzed and reported in the 2010 Handbook and in the 2017 playground injury statistics report, *Injuries and Investigated Deaths Associated with Playground Equipment 2009-2014*.[5] Staff conducted an analysis of more recent injuries because the most recent playground injury statistics report is based on data that are over 10 years old. A footnote is added to the NEISS data described in section 1.7 to clarify their source.

E. Definitions (Section 1.8)

Comment: NPPAS recommended defining the terms "playground," "play component/play structure," "shock absorbing," "critical height," "flangeless tube connections," "impalement," and "designated play surface" to avoid ambiguity and align the Handbook with other standards.

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[4] NEISS is a statistically valid injury surveillance system based on a nationally representative probability sample of hospitals in the U.S. and its territories.

[5] The report is available at: https://www.cpsc.gov/content/Injuries-and-Investigated-Deaths-Associated-with-Playground-Equipment-2009-to-2014.

National Recreation and Park Association (NRPA) also recommended defining the term "shock absorbing."

Response: The final version of the Handbook adds descriptions of some of the recommended terms, such as "playground," "impalement," and "shock absorbing," that serve as definitions. The terms "critical height" and "designated play surface" are already defined in section 1.8. The terms "flangeless tube connections" and "play component" are no longer used in the Handbook, so formal definitions in section 1.8 of the Handbook are not needed. The term "play structure" is self-explanatory (*i.e.*, a structure for play) and is used contextually in several new and existing definitions, therefore, a formal definition is not needed.

F. Thermal Burns and Shading (Sections 2.1 and 2.5)

Comment: NPPAS and IPEMA recommended including a reference to CPSC publication 3200, *Burn Safety Awareness on Playgrounds*. NPPAS recommended emphasizing the importance of environmental hazards and the physical design elements that can influence the safety and thermal comfort of playgrounds. NRPA, IPEMA, and Blue Imp Recreational Products commented that the revised recommendations for shading are not feasible in the marketplace and will reduce access to playgrounds.

Response: The Commission agrees that including a reference to publication 3200 will be helpful. Publication 3200, which emphasizes the risk of thermal burns from playground equipment, was the impetus for many of the draft changes to the Handbook regarding burns and shading. The reference is added to section 2.1.1.

The new information on thermal burn hazards, including the reference to publication 3200, along with the pre-existing recommendations on shading considerations and the effects of extreme heat or cold on surfacing, are adequate to address the request to emphasize the importance of environmental hazards and physical design elements.

Shading is an important consideration for safety to mitigate burn hazards on playground equipment. The recommendations for shading allow playground designers to best address the need for shading and are not legally enforceable responsibilities. The phrasing of the recommendations in section 2.1.1 is revised to address the commenters' concerns. Additionally, section 2.5.6, which provided recommendations for shading plastics, added no new information and is removed.

G. Fencing (Section 2.1)

Comment: IPEMA and NRPA recommended removing the year designation that was added to ASTM F2049 for consistency with other referenced standards and to ensure that the latest version of the standard is reflected.

Response: The year designation (-11) was added to ASTM F2049 because of concerns that the standard would be revised to a guide, effectively reducing the level of safety it provides; CPSC staff voted negative on a ballot item aiming to do that.[6] To ensure consistency with other standards, the year designation is removed from ASTM F2049, and instead, specific recommendations for fencing are added in a new section, 2.1.2.

H. Gates (Section 2.1)

Comment: NPPAS and the Hummingbird Alliance recommended expanding the discussion of fence safety to include gate safety standards and to protect consumers from the risk of vehicular accidents, drownings, falling gates, and other adjacent hazards.

Response: The Commission agrees that gate safety is an important topic. The Hummingbird Alliance identified 13 fatalities related to gate incidents from September 2007 to May 2024 that would likely have been prevented by the newest revisions to the ASTM gate voluntary standards, including at least one incident at a playground. The relevant gate voluntary standards, ASTM F900, ASTM F1184, and ASTM F2200, have been updated over the past two years to protect

[6] Staff's letter is available online at: https://www.cpsc.gov/s3fs-public/2024-November-ASTM-F14-10-Playground-Fencing-Ballot-Response.pdf?VersionId=4xsADPfH7tNq2YuzY1dBTnkzVMP24wGA.

consumers from the unreasonable risk of being crushed by a falling gate. These standards are now referenced in the Handbook in sections 1.4 and 2.1, alongside recommendations for fencing to address nearby hazards, as requested.

I. Age Recommendations (Sections 2.2 and 5.3)

Comment: IPEMA requested to remove the following sentence from section 2.2.6 because it is unclear whether it applies to playground design or labels: "If the playground is used by multiple age groups, special consideration should be made for protecting children in the youngest age group." IPEMA also recommended adjusting the lowest recommended age for horizontal ladders from 4 years old to 2 years old. NPPAS recommended that horizontal ladders should not exceed 3-4 feet in height for younger children and consumers should be cautious of purchasing horizontal ladders for preschool children.

Response: The Commission agrees that the referenced sentence in 2.2.6, which was included in the draft as an update, should not be included in the final update because age considerations are addressed in sections 2.2.2 and 2.2.3, and the added sentence did not provide clarity. The Commission disagrees with adjusting age or height recommendations for horizontal ladders, as most 2-3-year-olds lack the physical ability to use a horizontal ladder without risking injury, and the data used to support a maximum 3-4-foot height for young children is unclear.

J. Supervision (Section 2.2.7)

Comment: Richter Spielgeräte GmbH recommended adjusting supervision recommendations to allow walking barefoot. IPEMA recommended adding a statement to "limit children from running on, under, and around equipment," to reduce the risk of children running into equipment.

Response: The Commission is aware of burn incidents on playgrounds due to children being barefoot (see publication 3200). Therefore, the Commission disagrees with revising the recommendation to make sure children are wearing footwear. While the Commission agrees in principle that limiting children from running on, under, and around the equipment could reduce

injuries, caregivers may not have the practical ability to follow this recommendation, which could increase the likelihood that this advice is dismissed. Therefore, no recommendation is added to limit children from running on, under, and around equipment.

K. Equipment Not Recommended (Section 2.3.1)

Comment: IPEMA recommends rewriting the list of examples of heavy swinging and rotating equipment subject to suspended element impact attenuation testing in ASTM F1487 for the following reasons: swinging gates and doors are not subject to suspended element impact attenuation testing; giant strides are not subject to the testing and should still be included on the list of equipment not recommended; and tire swings are subject to suspended element impact attenuation testing, so should not be excepted from the examples. APE Studio and NRPA suggested that some multi-user swings should be allowed if they pass swing impact testing. NRPA added that public play areas have safely incorporated inclusive/generational swings. A safety consultant questioned how a consumer or an inspector would know if a product met the requirements in ASTM F1487, section 8.6.7.

Response: The Commission agrees that swinging gates, doors, and giant strides are not subject to suspended element impact attenuation testing and therefore removed this equipment from a list of examples for that testing. Giant strides are added back to the list of equipment not recommended because giant strides pose a unique impact and fall hazard to children using the equipment. The Commission also removed tire swings as an exception to suspended element impact attenuation testing and agrees that some multi-user swings should be allowed. However, the impact testing in ASTM F1487 does not appear to account for the mass of users of the swing. Therefore, the Commission cautions that because some multi-user swings, such as generational swings, are relatively new to public playgrounds, it is unclear whether they may pose unique hazards to users. The Commission will continue to monitor incident data for emerging hazards related to these products.

Playground operators are expected to know whether their equipment has been certified to

meet ASTM F1487 before installation, and consumers and inspectors should be able to contact the equipment owner and/or manufacturer to obtain such information, if necessary.

L. Surfacing – loose-fill rubber (Section 2.4)

Comment: Recycled Rubber Coalition (RRC), Recycled Materials Association (ReMA), U.S. Tire Manufacturer's Association (USTMA), and IPEMA commented that the discussion of rubber mulch as potentially "toxic" is inaccurate and is not based on scientific consensus; RRC and USTMA referred to the EPA's Federal Research Action Plan on tire crumb as supporting evidence for their comment. RRC added that all references that imply recycled rubber poses a risk, a hazard, or is toxic should be removed.

Response: The Commission has revised the short-hand for ASTM F3012 testing to accurately reflect the requirements of F3012 by stating "loose-fill rubber testing" instead of "toxic/hazardous metal testing," which has been deleted in sections 2.4 and 3.7. The Commission, however, disagrees with the statement that no recycled rubber poses a risk or a hazard. The testing in ASTM F3012 limits the concentration of hazardous metals (such as arsenic, chromium, and lead) and places a size limit on tramp metals to mitigate the potential hazards posed by loose-fill rubber surfacing. Untested rubber mulch has not been verified to mitigate these hazards and should therefore be avoided. References to the risks or potential hazards of using such materials are clarified but remain in place.

M. Surfacing – Recommended Surfacing Materials (Section 2.4)

Comment: IPEMA, ReMA, RRC, and USTMA commented that it is inaccurate to single out the risks of rubber mulch compared to other loose-fill surfacing materials. IPEMA, NRPA, and ForeverLawn explained that the use of synthetic turf as a unitary play surface has been rapidly growing and should be referenced in the Handbook. Richter Spielgeräte GmbH and NPPAS suggested emphasizing maintenance of loose-fill surfacing. A safety consultant, IPEMA, and NRPA offered various edits for Figure 1 and Table 2, which they asserted conflict with ADA or ASTM standards or with other material in the Handbook.

Response: The Commission agrees that rubber mulch should not be singled out in comparison to other loose-fill surfacing materials, such as engineered wood fiber. Therefore, the Handbook is revised to discuss both ASTM F3012 and ASTM F2075, where appropriate. The Commission is aware that synthetic turf has seen increased use as playground surfacing in recent years and that ASTM is in the process of developing a proposed standard for synthetic turf for playground surfacing. At this time, CPSC does not have data on the installation and testing of synthetic turf supporting its inclusion in the Handbook. The Commission may consider this information in future editions, if the data becomes available.

The Commission appreciates the identification of discrepancies with Figure 1, Table 2, and the characterization of rubber mulch. These issues are addressed in section 2.4.

N. Surfacing – Critical Height and Fall Height (Section 2.4)

Comment: IPEMA recommended harmonizing the definition of "critical height" with ASTM F1292. NPPAS commented that there are inconsistencies in fall heights for different pieces of equipment.

Response: The definition of "critical height" in the Handbook aligns with the last sentence of the definition of "critical fall height" in ASTM F1292. This alignment avoids technical descriptions of the performance criterion in ASTM F1292 and is adequate for the purposes of the Handbook. The fall heights, identified as being inconsistent by NPPAS, are two different hazard scenarios for different equipment types: one is a fall height from equipment onto the same equipment; the other is a fall height from equipment (*e.g.*, embankment slides, balance beams) onto protective surfacing. In response, the Commission clarifies, in section 5.3.9, that composite structures should be considered one structure with a single critical height based on the highest fall height for the structure.

O. Playground Hazards (Section 3)

Comment: IPEMA commented that the Handbook should exempt any portions of equipment located more than 84 inches above any underlying designated play surface from the

recommendations in section 3. NPPAS recommended adding an illustration for crush or shear hazards rather than directing consumers to ASTM F1487 for testing criteria. IPEMA recommended exempting partially bounded openings below 24 inches to align with major recognized playground standards including ASTM F1487, CSA Z614, and EN 1176. IPEMA also recommended including a reference to the sharp points and edges requirements in 16 CFR 1500.48 and 1500.49 to align with ASTM F1487. In addition, IPEMA recommended allowing chimes, tubes, and other musical instruments to have open ended tubes provided there are no sharp edges. NPPAS commented that the statement, "consider using plastic playground equipment that resembles tires," is unclear.

Response: The Commission disagrees that portions of equipment located more than 84 inches above any underlying designated play surface and that partially bounded openings below 24 inches should be explicitly exempted from the recommendations in the Handbook. These exemptions are a technical specification in ASTM F1487 that are based on the ASTM playground subcommittee's assessment that children are unlikely to reach 84 inches above play equipment and are unlikely to become entrapped in partially bounded openings less than 24 inches from the ground. The Handbook already refers to ASTM F1487 for technical specifications and tests. Similarly, the Commission concludes that the reference to ASTM F1487 testing criteria for crush/shear hazards is adequate, as the hazard can be specific to certain pieces of moving equipment (as discussed in section 3.1) and the reference is consistent with existing recommendations in the Handbook.

The Commission also disagrees that the testing in 16 CFR 1500.48 and 1500.49 for sharp points and edges should be referenced because the Handbook already describes practical ways that consumers can evaluate potential sharp points and edges, rather than relying on a specific test that most consumers will not be able to perform.

The Commission agrees that caps or plugs may not be appropriate for chimes, tubes, or other musical equipment with no sharp edges because caps or plugs will prevent such musical

equipment from functioning. Section 3.4 is revised to allow musical equipment to have exposed open ends so long as the ends are rounded and are guarded from potential impalement and entrapment hazards. Additionally, to clarify the recommendation, the unclear statement on using "plastic playground equipment that resembles tires" is revised to refer to equipment that "simulates tires" as stated in the 2010 Handbook.

P: Strangulation Hazards (Section 3.2)

Comment: A safety consultant commented that the strangulation pictogram in section 3.2.1 is offensive and would be disturbing to children. NPPAS commented to state that the pictogram is a great addition. IPEMA recommended changing "scarves" to "neck scarves" in the text of the strangulation warning to not discriminate against cultures that wear head scarves.

Response: The Commission appreciates the support for the strangulation pictogram. An additional example warning label is added without the pictogram in section 3.2.1 for readers of the Handbook who think the example pictogram is not appropriate. The Commission agrees with the recommended change from "scarves" to "neck scarves," which more accurately conveys the strangulation hazard, and revised the text accordingly.

Q: Suspended Component Hazards (Section 3.5)

Comment: IPEMA recommended modifying the suspended component hazard section to add multiple suspended components to the list of equipment to which the recommendations do not apply, and to align with the recently balloted corresponding section in ASTM F1487 which includes requirements for increased visibility of suspended hazards.

Response: The Commission concludes that the hazard mitigation steps listed in section 3.5 for suspended hazards apply to both single suspended components and multiple suspended components. This section is further clarified to state that other features, in addition to bright colors or contrast with the surrounding equipment and surfacing, can be used to increase visibility of suspended hazards.

R: Transfer Systems (Section 5.1.3)

Comment: IPEMA and Richter Spielgeräte GmbH commented that the draft Handbook's recommendation to label transfer points is unnecessary because it does not increase safety.

Response: The text in section 5.1.3 is revised to clarify that labeling of transfer points should be considered to help users identify them.

S: Guardrails and Barriers (Section 5.1.3)

Comment: IPEMA commented that upper body equipment, entry to stairways, and entry to ramps should be included among the equipment to which the guardrail and barrier recommendations do not apply. IPEMA also suggested that barriers on stairs should be treated differently than other types of equipment and should be required on all stairs greater than 48 inches above the protective surfacing.

Response: The Commission agrees that upper body equipment and entryways do not require barriers or guardrails and added them to the examples of equipment to which the recommendations do not apply in section 5.1.3. The revisions in the draft Handbook clarified that barriers are recommended on all elevated platforms, including stairs, greater than 48 inches above the protective surfacing (and lower on equipment for toddler and pre-school age children). These revisions are included in this final update.

T. Rungs (Section 5.2.2)

Comment: IPEMA recommended removing the preference for a rung diameter of 1.25 inches for maximal grip because the recommended grip range is sufficient for design. IPEMA also recommended increasing the maximum rung spacing to 18 inches (similar to the maximum step height for adjacent platforms) in Table 6 for older children.

Response: The Handbook's recommendations for a preferred rung diameter and rung spacing and the rationale for their inclusion is based on the COMSIS Human Factors Report. Therefore, the Commission is not revising this section.

U: Handrails (Section 5.2.3)

Comment: IPEMA commented that the handrail height of 22 inches to 26 inches for children ages 2 to 5 is overly restrictive and makes it difficult to meet guardrail and handrail recommendations and to meet entrapment space requirements. IPEMA suggested that the recommended height range for school age children should be harmonized with ASTM (22 inches to 38 inches).

Response: The Commission continues to recommend a lower handrail height for 2- to 5-year-old children based on the COMSIS Human Factors report.

V. Equipment Maximum Height (Section 5.3)

Comment: NPPAS recommended providing a maximum height on different play components for children of different ages due to a growing body of research that connects equipment height and surfacing materials to injury.

Response: The Commission has not analyzed data which supports recommending specific maximum heights on different playground equipment. Maximum height recommendations should be considered by the ASTM playground subcommittees and could be considered in future revisions if supported by data analysis.

W. Climbing Equipment Internal Fall Distance (Section 5.3.2)

Comment: IPEMA recommended moving an arrow in Figure 9 to show where a child may fall.

Response: Figure 9 is updated to show arrows to measure the fall distance in locations where a child may fall.

X. Flexible Climbers (Section 5.3.2.3)

Comment: IPEMA suggested that the Handbook should not state that freestanding flexible climbers are not recommended for preschool children based on their assumption that there are flexible climbers that are functional for preschool age children. NPPAS stated that the Handbook should tell consumers to be cautious of purchasing freestanding flexible climbers for preschool children. Additionally, IPEMA recommended removing the reference to the perimeter

of a net opening between 17 and 28 inches in Figure 13 asserting that it has no bearing on whether an opening creates an entrapment.

Response: Flexible climbers are recommended for preschool age children only if there is another method of egress from the equipment. Freestanding flexible climbers are not recommended for preschool age children because there is only a sole means of access to the equipment. If young children become unable or unwilling to climb down while near the top of the equipment, they will be more likely to jump or fall off, increasing the risk of injury. For this reason, freestanding flexible climbers will continue to be not recommended for preschool age children.

The perimeter of net openings specified in Figure 13 is based on the perimeters of the small torso probe and large head probe (Figures B7 and B8, respectively) and is used to evaluate such openings to prevent head entrapment incidents. This information is added to the section 5.3.2.3.

Y: Track/Trolley Rides (Section 5.3.2.7)

Comment: A safety consultant and NPPAS recommended adding more information on seated track/trolley rides instead of directing the consumer to ASTM F1487. NPPAS recommended that equipment use zones for trolleys and other moving equipment should be addressed in the Handbook. IPEMA recommended clarifying that only the manufacturer's intended parts should ever be tied or attached to any moving part of the ride, rather than "nothing."

Response: The Commission concludes that the reference to ASTM F1487 is appropriate due to the many technical considerations included therein for the safety of seated track/trolley rides. The topic of equipment use zones and clearance zones or areas around the equipment that should remain clear of people or other equipment while in use spans multiple types of playground equipment which could span multiple sections of the Handbook, if addressed. These topics could be addressed in future editions of the Handbook, as the balance between technical and non-technical safety information is reconsidered. The Commission agrees with IPEMA's suggested clarification regarding manufacturer's intended parts and has removed "nothing" and replaced it

with "only the intended equipment." The Commission, however, cautions that manufacturer's intended parts should not be hazardous, as described in section 3 of the Handbook and elsewhere in ASTM F1487.

Z: Merry-go-rounds and other Spinning Equipment (Section 5.3.4)

Comment: NRPA and IPEMA recommended changing "Merry-go-rounds/Spinners" to "Rotating Equipment" for consistency with ASTM standards. Richter Spielgeräte GmbH and IPEMA stated that maximum requirements for platform heights in section 5.3.4 should not be required because there are design types that allow access for both preschool and school age children. These commenters also said that hand supports are not required for seat designs where the seating adequately secures children. Both commenters also asserted that the rotation speed formula in the draft Handbook may not be accurate for all rotating equipment. In addition, IPEMA recommended removing the term "clearance zone" because it lacks a clear definition in the Handbook and has a specific use in ASTM F1487.

Response: Most consumers colloquially understand or use the terms "merry-go-round" and "spinner." Therefore, for ease of use, those terms will continue to be used in the Handbook. The Commission will retain the platform height recommendations because the platform height can affect both child access and fall height. The Commission agrees that some seat designs, such as sufficiently concave or contained seating, can be used without hand supports because such seats are designed to contain children's bodies at the maximum rotational speed of the equipment, and has revised section 5.3.4 of the Handbook accordingly. The Commission also agrees that the rotation speed formula added in the draft Handbook is not accurate for all rotating playground equipment. Therefore, the formula is removed in section 5.3.4.1. The maximum recommended rotation speed, however, is retained. The Commission agrees to remove the term "clearance zone" because clearance zones are not currently defined in the Handbook.

AA. Seesaws (Section 5.3.5)

Comment: IPEMA recommended that designers should determine whether footrests are

necessary to include on spring-centered seesaws.

Response: The Commission agrees with the commenter. Some spring seesaws will move horizontally, like spring rockers and unlike fulcrum seesaws, and therefore should have footrests to assist users to stay on the equipment. Other spring seesaws will swing up and down like a fulcrum seesaw, in which case a footrest would be a potential crush hazard. This distinction is clarified in section 5.3.5.2.

AB. Slides (Section 5.3.6)

Comment: NPPAS requested an illustration for safety signage or labels and an illustration for embankment slides to clarify the recommended maximum height of 12 inches above the underlying ground surface. IPEMA recommended that the slide exit slope be harmonized with ASTM (0-10 degrees below horizontal) to get proper drainage. A safety consultant agreed with the existing slope recommendation (0-4 degrees below horizontal). IPEMA suggested harmonizing the recommendations for slide exit clearance zones with ASTM F1487. The safety consultant recommended that the entanglement hazard on slides in section 5.3.6.7 should be described as a "narrowing gap" because "that is where a drawstring gets hung up."

Response: Generally, signage and labeling recommendations are addressed in the Signage and/or Labeling section, 2.2.6, and example strangulation warnings are addressed in the Strings, Straps, and Ropes section 3.2.1, which includes an illustration with a slide. The recommendations for embankment slides to have a maximum height of 12 inches above the underlying ground surface are clearly expressed and therefore the Commission finds that an additional illustration is unnecessary.

The Handbook's existing slide exit slope recommendation of 0-4 degrees below horizontal reduces the risk of injury from falls related to children exiting the slide too fast. CPSC is unaware of incident data which demonstrates that water at slide exits poses a risk of injury, and the Handbook's slide exit slope recommendations overlap with ASTM F1487's slide exit slope requirements. Therefore, the slide exit slope recommendations remain unchanged.

As described in other comment responses, "clearance zones" are not currently addressed as a specific topic in the Handbook. However, Figure B13 in the appendix describes recommended areas to test for slide entanglement protrusions and may address the commenter's concerns.

The Commission concludes that gaps at the tops of slides where the slide chute connects with the platform do not need to be "narrowing" to pose a strangulation hazard on slides, and that the recommendation to remove gaps that can entangle clothing or strings is adequate; therefore, the entanglement hazard description remains unchanged.

AC. Swings (Section 5.3.8)

Comment: IPEMA recommended that all swing seats should be impact tested per ASTM F1487, the use of the term "belt seats" should be changed to be "swing seats" in section 5.3.8.3., general to-fro swing seats should be allowed to be multi-user, bucket swing pivot point height recommendations should only apply to swings intended for toddlers, and a play area with only a single swing bay be allowed to have a full bucket seat with other seat types in the same bay. A safety consultant recommended that section 5.3.8.4 on multi-axis swings include other types of dish or saucer swings, not just tire swings.

Response: The Commission agrees that all swing seats should be impact tested in accordance with ASTM F1487 to reduce the severity of injury from swings impacting people on their paths; this is added in section 5.3.8.

The Commission concludes that the suggested change from "belt seat" to "swing seats" would require additional changes throughout the Handbook to adequately address safety issues. For instance, the examples of age-appropriate equipment in Table 1 describe the appropriateness of belt swings; Table 7 describes minimum clearance dimensions for belt swings; and the use zone for belt swings is described in section 5.3.8.3.3. Removing specific recommendations for belt swings in section 5.3.8.3.1 would raise a question about the specific mention of belt swings in these sections. Generalizing the recommendations in these other sections is not always

logical. Therefore, the change will not be made. The Commission also rejects the recommendation to allow general to-fro swing seats to be multi-user because section 5.3.8.3.1 addresses belt seats only, and belt seats can only accommodate a single user safely.

In addition, the Commission will maintain the current pivot point height recommendations for bucket seats to ensure toddlers are protected from potentially hazardous falls because caregivers are unlikely to distinguish full bucket seats intended for toddlers from full bucket seats intended for older pre-school age children.

The Commission agrees that small playgrounds with only a single swing bay may include different types of swings in the same bay with reduced risk, the corresponding change is made in section 5.3.8.3.2 to state that "when possible," full bucket seat swings should be in separate structures or bays. Section 5.3.8.4 on multi-axis swings is also revised to include all types of multi-axis swings, including tire swings.

Abioye Mosheim Oyewole, Acting
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Consumer Product Safety Commission.

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