QS# 5521

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, DC 20207

2001 OCT 25 P 1:20

Memorandum

DATE: OCT 22 2001

TO : The Commission

Through: Todd Stevenson, Acting Secretary
Through: Michael S. Solender, General Counsel
Caroline J. Croft, Executive Director
Ronald Medford, Assistant Executive Director, EXHR
Alan H. Schoem, Assistant Executive Director, EXC
Terri Rogers, Associate Director,
Recalls and Compliance Division

FROM : Jean Kennedy, Office of Compliance, Project Manager

SUBJECT: FY 1999-2000 Voluntary Standards Conformance Monitoring Program for Home Playground Equipment

BACKGROUND:

The Commission approved a FY 1999 Compliance program to monitor manufacturers' conformance to the ASTM Voluntary Standard F1148-98c, "Standard Consumer Safety Performance Specification for Home Playground Equipment." The ASTM standard specifies requirements for the performance and labeling of home play equipment and instructions to consumers. The standard addresses potential injuries to the intended users, who are children 18 months through 10 years of age.

CPSC estimates that there were about 47,000 home playground equipment-related injuries treated in U.S. hospital emergency rooms in 1999. The data indicates that the greatest number of playground injuries resulted from falls. CPSC also received reports of 90 deaths on home playground equipment from 1990 to 2000.

From the data, the staff determined that most deaths and serious injuries on home playground equipment resulted from falls, head/neck entrapments in ropes and spaces, head impact with moving components, and lacerations or clothing entanglement on protrusions and bolts. To address these, the standard:

- prescribes barrier and railing heights to prevent falls from platforms and walkways;
- requires ropes be anchored at both ends because of children's tendency to put ropes around their necks in play;

WITH ATT. A

CPSA 6 (b)(1) Cleared
No Mfrs/Prvtlbl Identified
Excepted by
Firms Notified,
Comments Processed

ATTD, APPE Removed 10/25/01

NOTE: This document has not been reviewed or accepted by the Commission.
Initial _____ Date 10/22/01

- specifies certain size openings in ladders and angles, such that the smallest [5th percentile] two-year-old child's body cannot enter or that the head of the largest at-risk user [the 95th percentile five-year-old] can pass through in order to prevent entrapment or hanging;
- specifies spaces between swings and poles to prevent head impact;
- specifies properly gauged vertical and horizontal bolts to prevent lacerations or strangulation from snagged clothing.

Other standard requirements, not monitored in this project because they are associated with fewer injuries, address the following: stability, sharp edges, pinch/crush/shear points, lead in paint, durability and toxicity of building materials, hardware and installation.

PROCEDURES:

The Directorate for Economic Analysis identified a total of 32 home playground manufacturers located in the United States. [1] The manufacturers included five major manufacturers whose individual estimated yearly sales exceeded 10,000 units and 23 minor (medium-to-small) manufacturers whose individual estimated sales were less than 10,000 units per year. The remaining manufacturers, whose production numbers were not provided, included two popular manufacturers of plastic backyard playsets and two wood playset manufacturers. [A "non-public" list of the manufacturers is attached at Tab A.]

The Home Playground Monitoring Project Team[2] selected 22 requirements from the ASTM Home Playground Standard to evaluate the manufacturers' equipment. These requirements, that address the major hazards and injuries on playground equipment, are categorized below:

- Head entrapment and strangulation: in ladders, railing spaces, acute structural angles and non-anchored ropes
- Fall injuries, including fractures and concussions: from platforms without proper railing or barrier heights
- Lacerations or strangulation involving clothing entanglement: from protruding bolts
- Head injury: from impact with moving components
- All injuries: due to absence of installation or replacement information.

In FY 1999, the team devised protocols for using head and torso probes and gages and conducted training for CPSC field investigators [attached at Tab B]. We prepared a protocol manual for evaluating the play equipment that was organized into the above five hazard areas and specified the selected 22 ASTM requirements that address those hazards [attached at Tab C]. The field investigators inspected and tested manufacturers' equipment from October 1999 through March

[1] Not included in this monitoring are an unknown number of local entrepreneurs who make backyard play equipment or design play structures that incorporate other manufacturers' components into their sets.
[2] The team included Mark Kumagai ESME, Debra Sweet EPHA, Mary Donaldson EC, Scott Heh ESME, Celestine Kiss ESHF, and Jean Kennedy, Compliance.

2000. The Directorate for Epidemiology analyzed the information collected by the field investigators and that report is included at Tab D.

RESULTS:

The CPSC monitoring evaluation reports indicated that the 32 known manufacturers sold at least 1,060,000 backyard sets in 1999 and had a conformance rate of 81% to the selected safety requirements of the ASTM standard. The five major manufacturers, who sold 97% of the estimated total number of sets of equipment (1,024,000 sets), had a conformance rate of 96% to the selected standard requirements. The group of 23 minor manufacturers, whose sales accounted for the remaining 3% of the estimated market (approximately 36,000 sets), had a 75% conformance rating for the selected standard requirements. All of the major manufacturers had a copy of the ASTM standard, while not quite half of the minor manufacturers had a copy of the standard. Some manufacturers presented older versions of the standard.

MAJOR MANUFACTURERS:

Of the five major manufacturers evaluated, three were in complete conformance and two failed to meet a combined total of three of 22 requirements. The three failures were: the top row of a cargo net had openings that measured 8 ¼ inches in width instead of the specified 9 inches; smooth nuts covering 6 bolt ends located under the top bar of the swingset protruded slightly past the test gage; and one firm's name was not on the equipment. While two firms' play sets did not technically meet three requirements, CPSC staff determined that the non-conformances did not present significant hazards. (1. The cargo net 8 1/4 inch spaces were larger and different than those reported in CPSC data where head entrapments occurred, i.e. those spaces were 5-7 inches wide and had rigid boundaries. (2. The slightly protruding bolt ends were covered with smooth rounded nuts to prevent lacerations and were located under the top beam where they would not likely cause injury or clothing entanglement that could lead to strangulation. (3. The firm's name was not on the play set, but was on packaging and instructions. Following our November 1999 inspection, one manufacturer sent a letter stating that the cargo net openings in the top row were corrected to the required 9-inch spaces and its name was included on its new line of play sets.

MINOR MANUFACTURERS:

Of the 23 minor manufacturers of home play sets evaluated, three had a 100% conformance rate, seven had a 79-94% conformance rate, and 13 had a 33%-77% conformance rate. The seven had mostly non-conformances that would be unlikely to lead to a serious injury. Those included: spaces that did not quite meet the standard but would not likely result in entrapment; railings that failed the height requirement by small amounts, i.e. between 1-3 inches; bolts that protruded a small amount and were located where children would not likely make contact with them; and lack of required consumer information, i.e. the firm's name or address was not on the set or guidelines for use of playground surfacing materials under the play equipment were not provided in the packaging. However, four had potentially serious failures: an accessible "V" space; a

seven-foot rope that was unanchored; two ropes that had no anchoring instructions; and protruding bolts below a platform and along a top beam that could present a significant hazard.

The 13 minor manufacturers with 33% to 77% non-conformance each had at least one significant non-conformance issue. The potentially serious non-conformances included: spaces in ladders, platforms and angles in which children could get their head or neck entrapped; barriers and railings on platforms that might not prevent children from falling off; protruding bolts in locations that could cause lacerations or clothing entanglement; and non-anchored hanging ropes that could lead to strangulation when children play with them. And because of children's tendency to play with ropes, we also considered failure to include instructions to anchor all ropes as a serious non-conformance issue.

OTHER MANUFACTURERS:

The four firms who gave no sales information included two popular plastic backyard equipment manufacturers and two wood equipment manufacturers. All had copies of the ASTM standard. One plastic equipment manufacturer failed to have the required height railing on a platform and the other was in 100% conformance to the standard. One wood equipment manufacturer failed to provide contact information on the playset and the other wood manufacturer was in 100% conformance to the standard.

CONCLUSIONS:

The 1999-2000 monitoring results indicated that the major U.S. home playground equipment manufacturers were in possession of the ASTM standard for home playground equipment. Their estimated one million backyard playsets sold represents 97% of total backyard playsets sold in 1999. And they had a 96% conformance rating to the selected ASTM home playground standard requirements with no potentially serious hazards that cause injuries to children. Of the smaller manufacturers of backyard playsets, about half did not have the standard and, therefore, may not understand the safety requirements for spacing and measurements when manufacturing their playset components. As a group, these minor firms had a 75% conformance rating and manufactured 3% of backyard playsets sold in 1999.

In addition to achieving our primary objective of determining levels of conformance to the standard, the 1999-2000 CPSC monitoring program reached new and small manufacturers and informed them about the serious hazards that the ASTM Home Playground Equipment Standard requirements address. We also made them aware of the CPSC's mission to prevent serious injuries to consumers and our monitoring of voluntary standards.

FOLLOW-UP ACTIONS:

To promote further conformance to the ASTM Standard for Home Playground Equipment (F1148), the Office of Compliance staff has sent letters to all home playground equipment

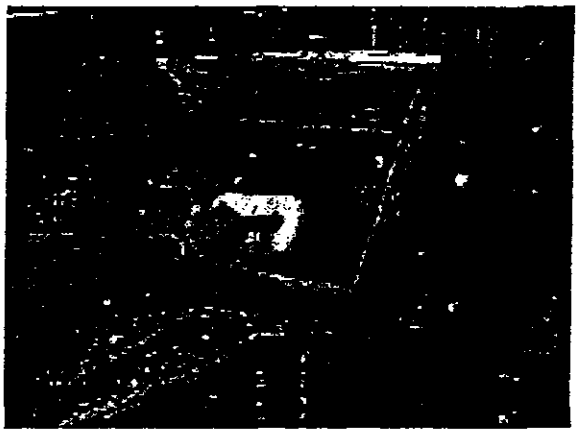
manufacturers that we inspected, providing the results of our testing of their equipment. We requested each firm to conform to all requirements to prevent hazards to children. For firms with non-conforming components on their playsets, we requested that they inform us of actions they plan to take to correct the components. Compliance staff will monitor the responses to determine if any additional action is necessary.

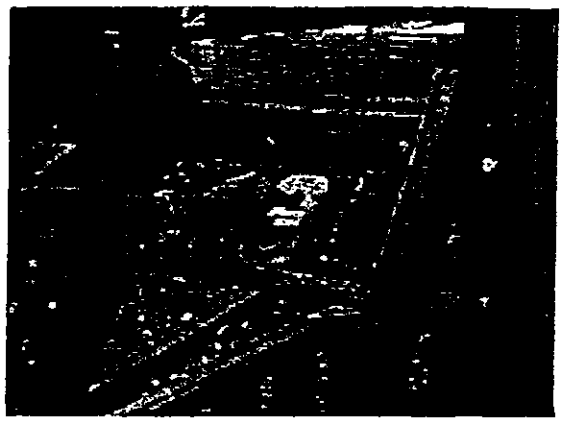
LIST OF ATTACHMENTS

ATTACHMENT B

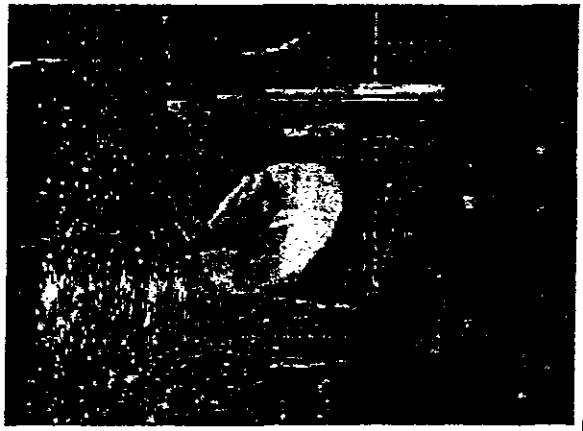
How to Use Head and Torso Templates

Rigid Openings





Child's body (torso template) can pass through this space.



Child's head (9 inch head template) will not pass through.

INCORRECT: This does not represent a child's head. Do not pass the template through on its side.

This opening FAILS the entrapment tests. The Torso (template) passes through the opening, but the Head (template) does not.

Rigid Openings

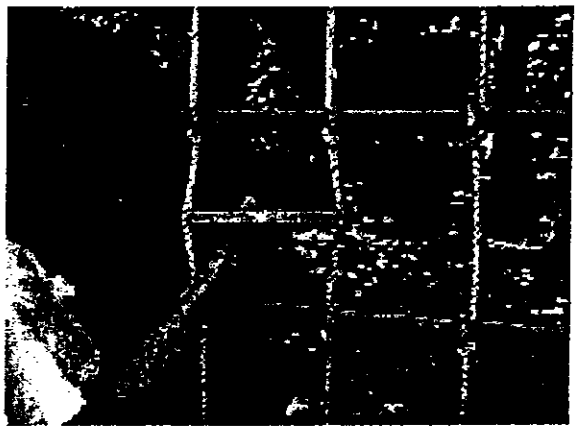
Child's body (torso template) can not pass through this space in any orientation.

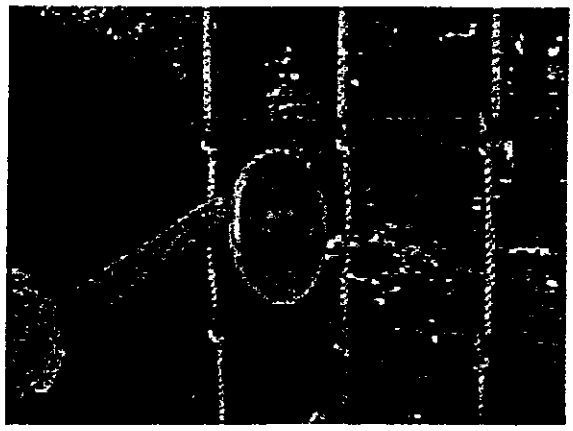
This opening <u>PASSES</u> the entrapment test. The Torso template does not pass through the opening.

Non-Rigid Openings (e.g. Cargo Nets)

Child's body (torso template) can pass through this opening.

The child's head can push through some non-rigid openings.





Turn template sideways in both directions and push through opening.

This Cargo Net <u>PASSES</u> the entrapment tests. Both Torso and Head templates pass through the openings.

Use Protrusions Gages for protrusions facing sideways or down

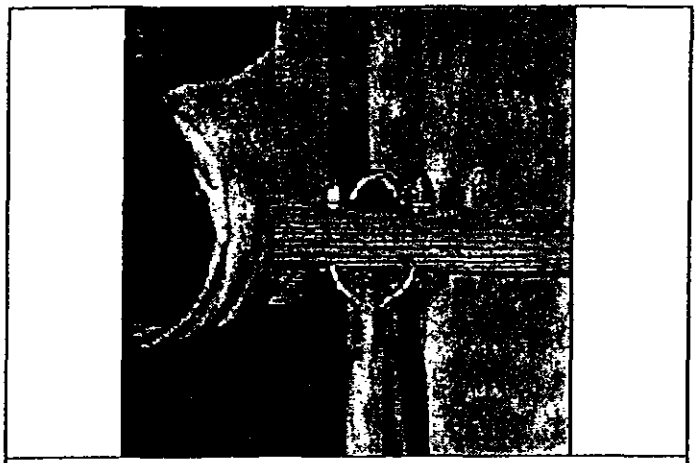
Place the test gage over the protrusion.

The protrusion does not extend beyond the larger test gage.

The protrusion extends beyond the smaller test gage and is a hazard.

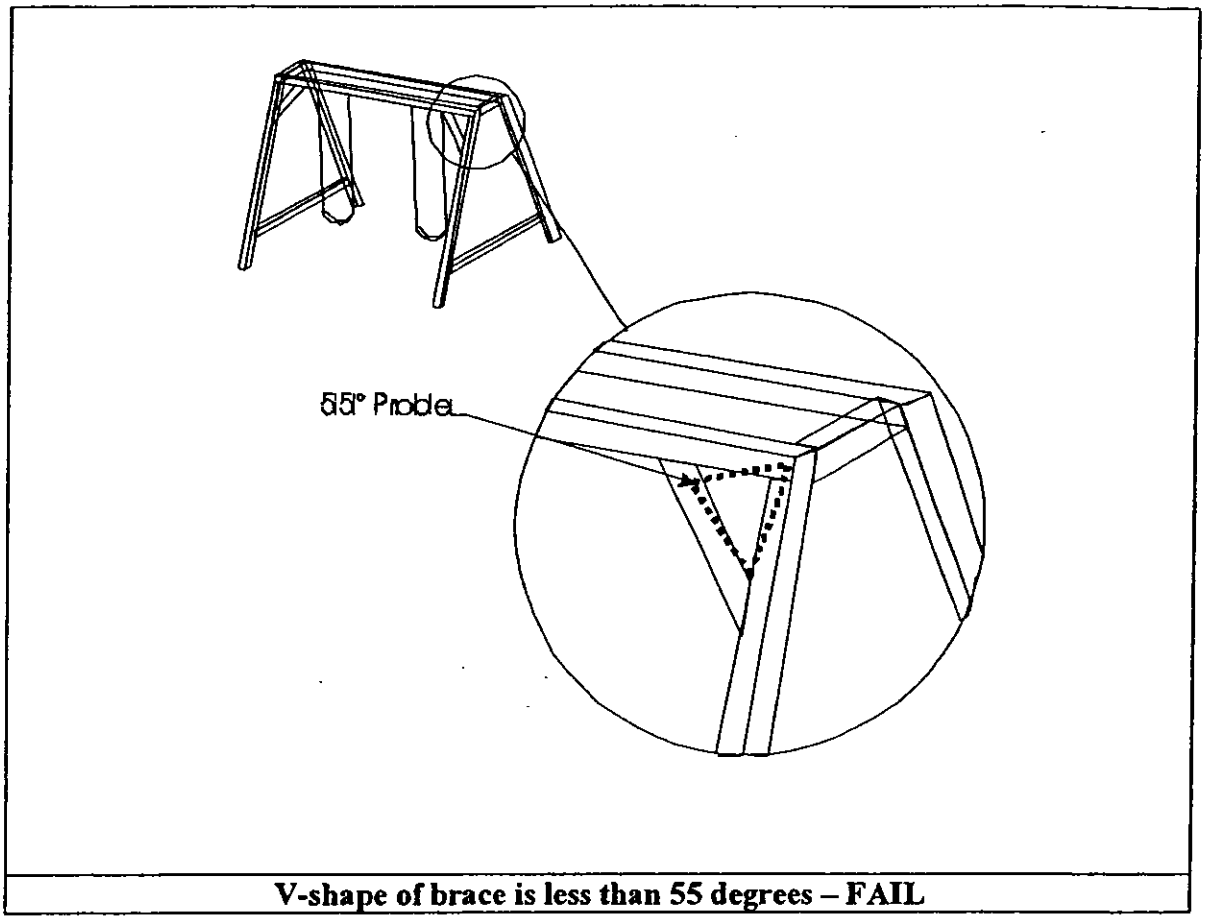
Place all size gages over protrusions. If bolts extend beyond any of the gages, they <u>FAIL</u>.

Use ruler for protrusions facing upward



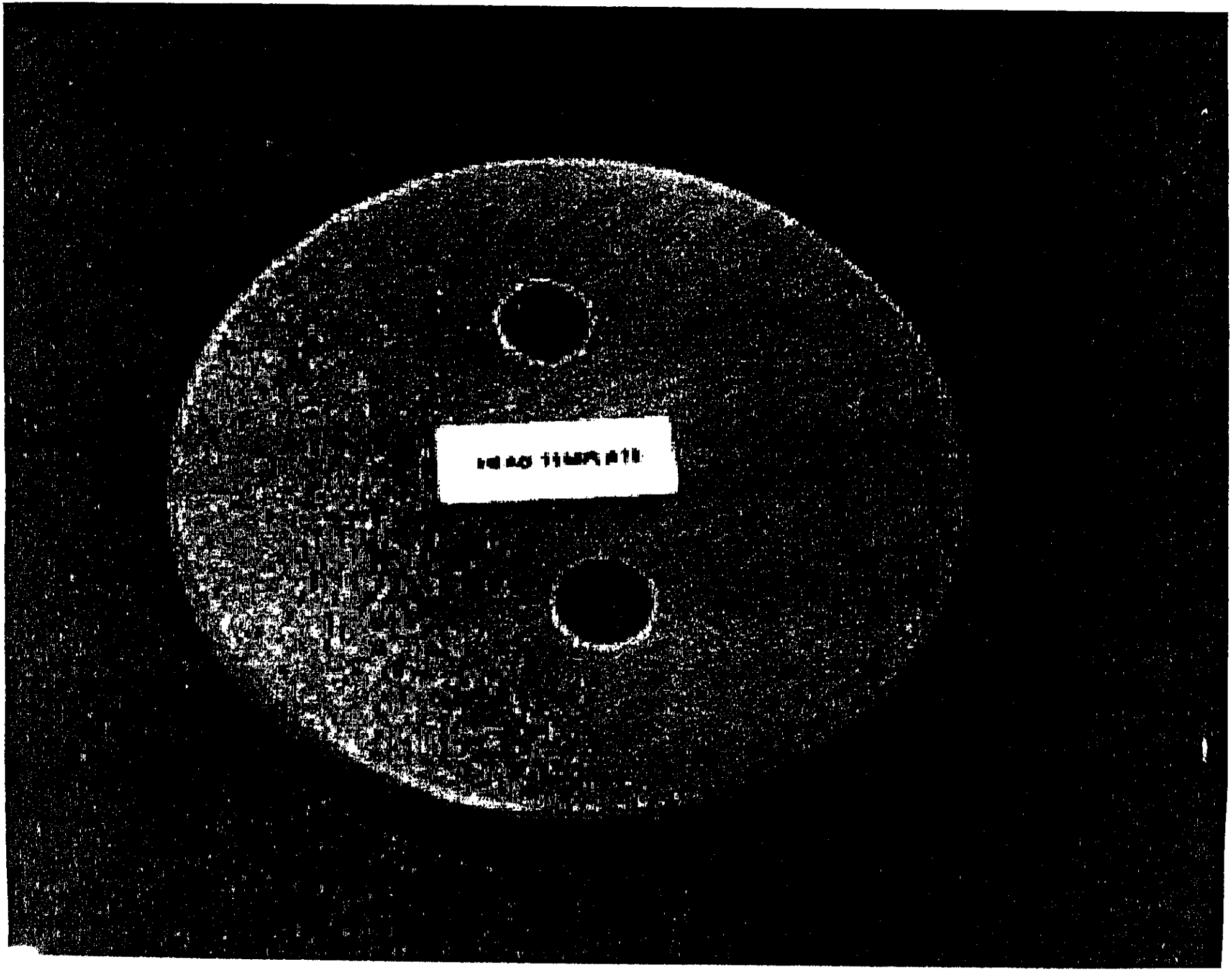
<u>FAILS</u>–vertical protrusion greater than 1/8 inch.

Use the 55 ° Angle Probe for V-Shaped Spaces

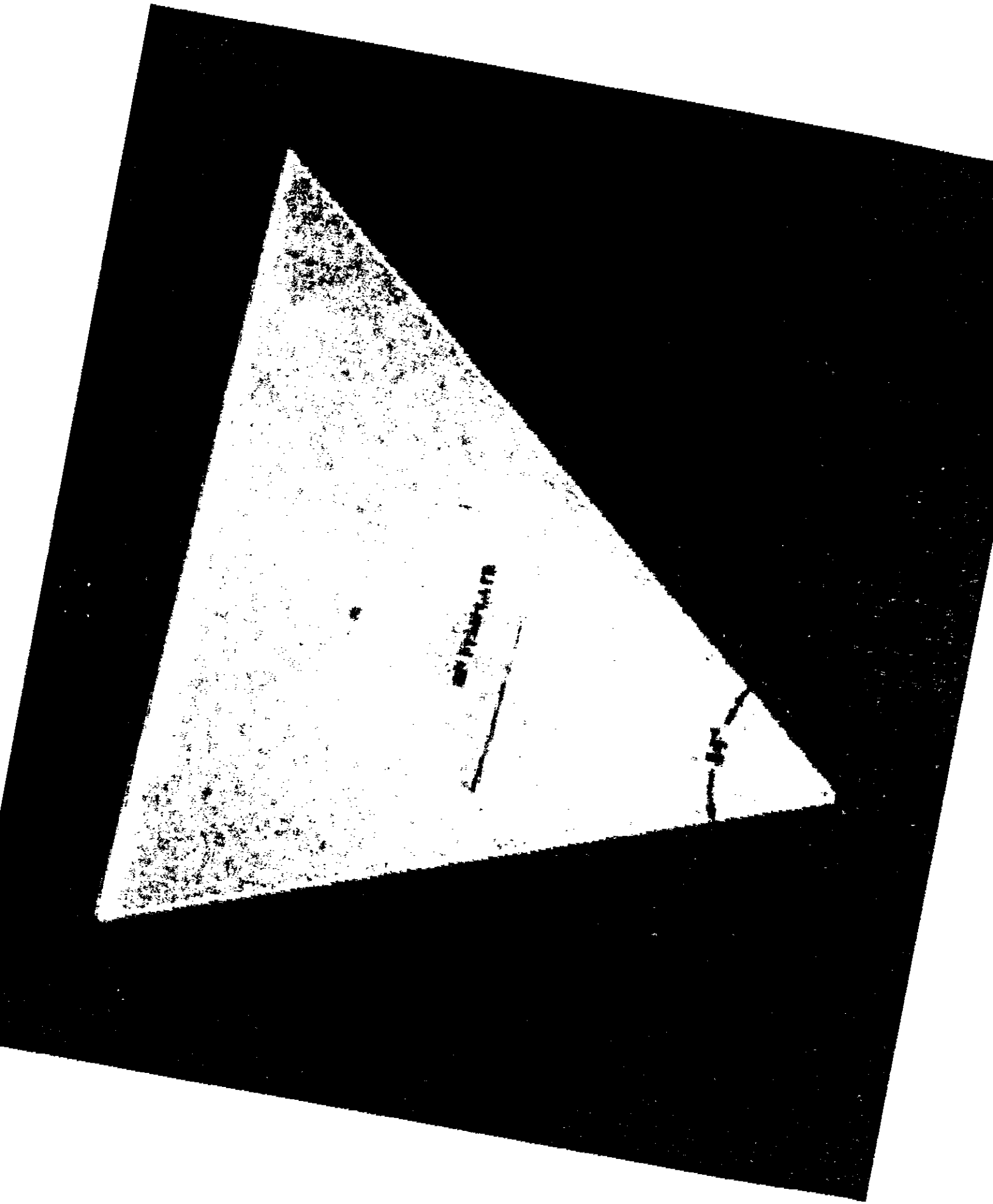


V-shape of brace is less than 55 degrees – FAIL

Insert 55° angle probe in V-shaped spaces. If an angle is smaller than the 55° angle probe (shown above), it <u>FAILS</u> because the V-shaped space could trap a child's neck.



TOKYO TEMPLATE



ATTACHMENT C

FY99 HOME PLAYGROUND EQUIPMENT MONITORING PROGRAM

DRAFT 7/30/99

Fax to: Jean Kennedy, Compliance Children's Team, Ext. 1360
Questions: Call Mark Kumagai, Engineering, Ext. 1237 or Jean Kennedy

TO MEASURE AND TEST SPECIFIC COMPONENTS:

TOOLS NEEDED: Torso template, head template, 55° template, and protrusion (bolt) gages in kit provided. Rulers, tape measure, and caliper to be supplied by investigator or Regional Office.

RULES: Measure a **"FAIL"** to the nearest failing **½ inch**. For the number of **"PASS' s"** add **(all)** *after number,* ***if all pass.***

PHOTOGRAPH: 1. Overall Structure
2. All "FAIL" components or spaces

INFORMATION ON FIRM

Name of firm:_____ Contact:_____
Address:_____
President:_____
Phone:_____ Fax:_____ Email:_____

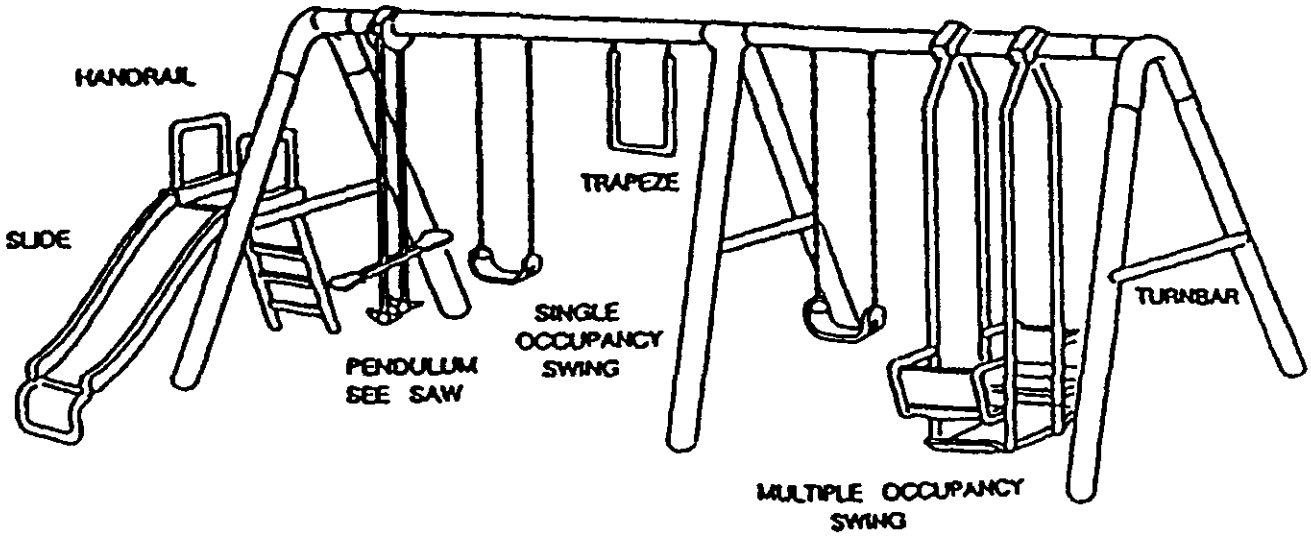
EXAMINE RECORDS

Ask to see a copy of the playground safety standard if any that they are following._____
Ask to examine copies of their testing to the standard. _____
If the are are not using ASTM F1148, advise them to them call 610-832-9585 to get it.
Ask to see copies of their testing to 16 CFR 1303, the CPSC Lead in Paint Requirements_____
Ask to see records of the total number of sets they sell per year?_____
This would include: KITS without lumber____ KITS with lumber____
Ask to see records of which large chain retailers they sell to_____
Request a copy of their 1999 Catalogue_____

SELECT A MODEL OF PLAYSET TO EXAMINE

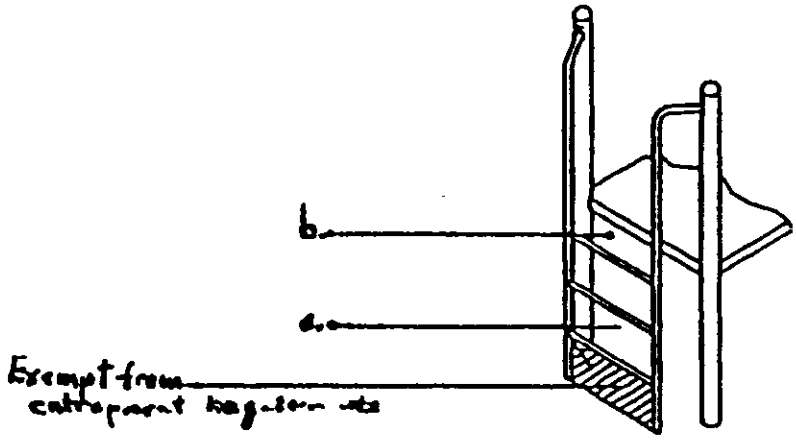
Select the model with the most play events that is set up for you to measure. Determine the number of units per year of this model that are sold per year_____

If assembled unit is not available to test: 1) ask for location where unit is set up to measure it. 2) collect installation instructions (see 15-18 on last page) NOTE: These are **field screening tests**, further examination and evaluation of the playground equipment may be needed to positively determine conformance to the standard.



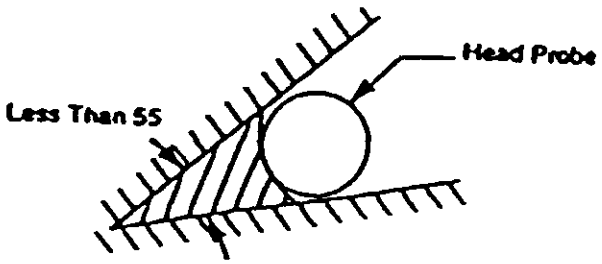
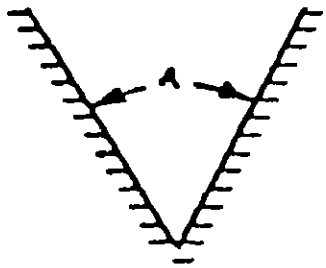
Swing Set (Metal)

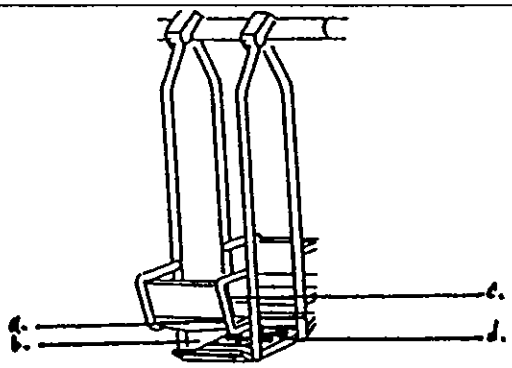
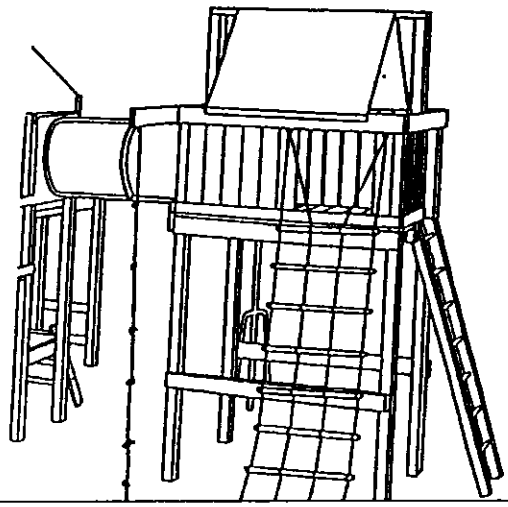
	PASS (Record the number of passing components or spaces or put "all")	FAIL (Record the number of failing spaces or components. Measure to nearest ½ Inch and note location)
☑ Spaces and Openings: Head Entrapment and Strangulation		
1. Ladder Spaces		
a. Between Rungs Insert head and torso templates. Both templates must pass through or neither can pass through. It is a failure if torso template passes through, but the head does not.		
b. Between rung and platform Insert head and torso templates Both templates must pass through or neither can pass through. It is a failure if torso template passes through, but the head does not.		



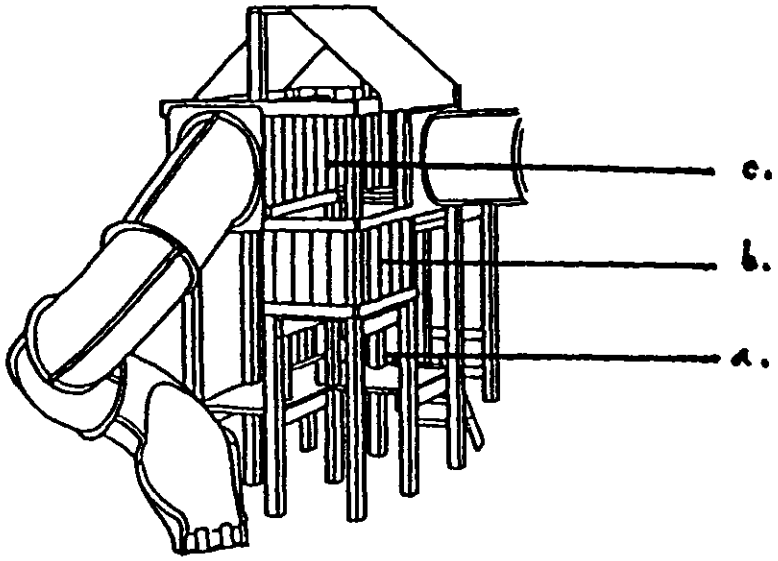
2. Platform Railings and Barrier Spaces Elevated platforms must have railings or barriers. (See #6 below). Use the head and torso templates to test spaces in these components.

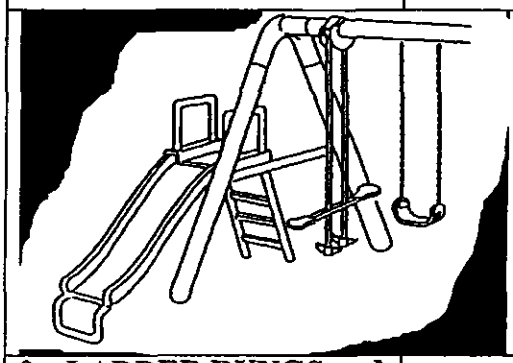
a. Between Railings and Posts Insert head and torso templates. Both templates must pass through or neither can pass through. It is a failure if torso template passes through, but the head does not.		
b. Between Platform and Railing or Barrier Insert head and torso templates. Both templates must pass through or neither can pass through. It is a failure if torso template passes through, but the head does not.		

	PASS (Record the number of passing components or spaces or put "all")	**FAIL** (Record the number of failing spaces or components. Measure to nearest ½ Inch and note location)
3. Angle Spaces		
a. **Braces on A-Frames** **If the angle is less the 55°**, the apex of the angle shall be filled so that the head template won't fit in OR when placed in won't touch bars. (Use 55 °Angle template to determine if angle is less than 55°)		
		
b. Upright "V" Spaces Shall be less than 55°. (Use 55° Angle template to determine)		
		
4. Non- Rigid Openings (e.g. Cargo nets) Insert head and torso templates. Both templates must pass through or neither can pass through. It is a failure if torso template passes through, but the head does not		

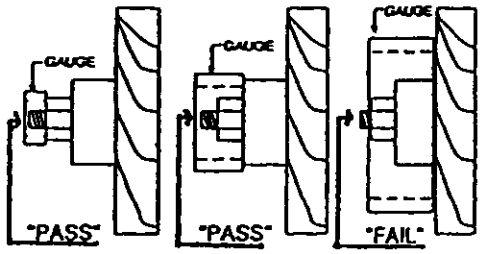
	PASS (Record the number of passing components or spaces or put "all")	FAIL (Record the number of failing spaces or components. Measure to nearest ½ Inch and note location)
5. LAWN SWING SPACES:		
		
a. Space between seat and backrest This space shall not be over 3"		
b. Space between seat and footrest This space shall not be over 10"		
c. Space between the seat-and the armrest Insert head and torso templates. Both templates must pass through or neither can pass through. It is a failure if torso template passes through, but the head does not.		
d. Foot slats The spaces between foot slats shall not be over 1 ½"		
6. ROPES Suspended climbing ropes, chains or cables shall be secured at both ends.		Include thickness of rope
		

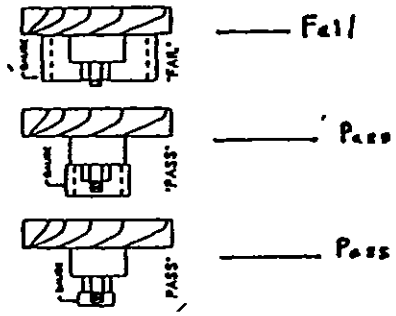
	PASS (Record the number of passing components or spaces or put "all")	**FAIL** (Record the number of failing spaces or components. Measure to nearest ½ Inch and note location)
☑ **FALL HAZARDS: FRACTURES/CONCUSSIONS**		
7. **PLATFORM RAILINGS & BARRIERS:** [measure all platforms from ground]		
A .If the platform is 30"-48" high it must have a **25"railing**		
b. If the platform is 48"-72" high it must have a **27"barrier**		
c. If the platform is over 72" high it must have a **33"barrier**		



	PASS (Record the number of passing components or spaces or put "all")	**FAIL** (Record the number of failing spaces or components. Measure to nearest ½ Inch and note location)
8. SLIDE RAILINGS & BARRIERS: There must be slide railings or other barrier on all sides of the transition area at the top of slide, except for the exit and entrance.		
		
9. LADDER RUNGS and CLIMBING EVENTS-GRIP WIDTHS: Shall not be more than 1.6" diameter. Use a caliper to measure diameter		

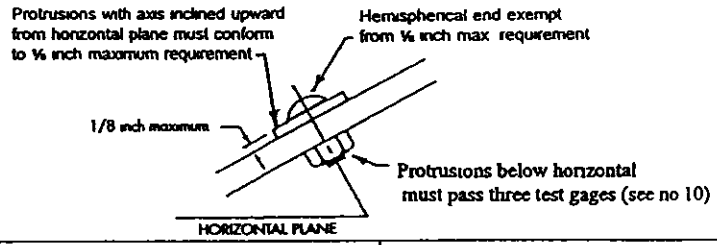
	PASS (Record the number of passing components or spaces or put "all")	**FAIL** (Record the number of failing spaces or components. Measure to nearest ½ Inch and note location)
☑ **PROTUSIONS: LACERATIONS and IMPALEMENTS**		
10. BOLTS [facing sideways or down]: Use the bolt gages. No bolts should extend beyond the test gages		



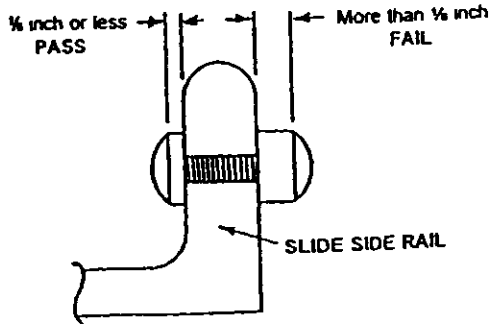


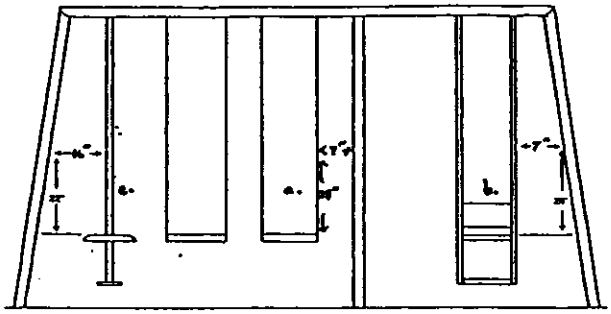
NOTE—Starting with the smallest gage, successively place each gage over the projection.

11. BOLTS [facing UPWARDS] Bolts should not protrude more than 1/8" above any surface to catch children's clothing. Hemispheric ends are exampt.		



12. PROTRUSIONS on SLIDES There shall be no protrusions more than 1/8" accessible to a child using the slide. A rounded surface protruding slightly beyond 1/8" is exempt.		



	PASS (Record the number of passing components or spaces or put "all")	FAIL (Record the number of failing spaces or components. Measure to nearest ½ Inch and note location)
☑ **IMPACT BY COMPONENTS: HEAD INJURIES** **NOTE: the measuring point for each swing ride is designed to approximate where a child's head would be.**		
		
13. SINGLE SWING SPACING: a. There shall be at least 7" from the support to the edge of the wing seat at 28" above the seat.		
13 LAWN SWING SPACING: b. There shall be at least 7" from the support to the outside edge of swing at 28" above swing seat.		
14. SEE-SAW SWINGS AND HORSE RIDES c. There shall be at least 16" from the center of the seat to the support. at 22" above the seat		

	PASS (Required Information IS provided with the set	FAIL (Required Information IS NOT provided with set)
☑**CONSUMER INFORMATION IS PROVIDED: HAZARD PREVENTION** **Please collect the following:**		
15. INSTALLATION INSTRUCTIONS		
16. ANCHORING INSTRUCTIONS		
17. PLAYGROUND SURFACING GUIDE:		
18.MANUFACTURER NAME,CITY, STATE, ZIP ON UNIT: **[photograph area]**		

ATTACHMENT D

HOME PLAYGROUND EQUIPMENT

CONFORMANCE MONITORING

PROGRAM

Debra Sweet
Directorate for Epidemiology
June 12, 2001

I. INTRODUCTION

The U.S. Consumer Product Safety Commission (CPSC) staff conducted a conformance study to determine the extent to which the manufacturers adhere to the voluntary standard for home playground equipment.

ASTM standard F1148, "Standard Consumer Safety Performance Specification for Home Playground Equipment" was originally published in 1988 to reduce the likelihood of life-threatening or debilitating injuries that may occur on home playground equipment. Multiple revisions of the standard have been made since 1988 - the latest published in 1998 (ASTM F1148-98c). The standard is designed to address hazards on wood, metal, plastic and combination equipment.

II. METHODOLOGY

CPSC staff identified 32 home playground equipment manufacturers with both large- and small-scale production.

These 32 manufacturers are not all of the home playground equipment manufacturers in the continental United States, although staff believes they represent the majority of the market. Staff did not include companies or individuals that order home playground equipment or components from the listed manufacturers.

CPSC staff developed an evaluation manual for CPSC field investigators to use during visits to the home playground manufacturers. The evaluation manual did not address all requirements of the voluntary standard (ASTM F1148-98c). Rather, staff concentrated on the requirements that address serious hazards such as head entrapment, strangulation, falls and lacerations. The field investigators were instructed on how to measure and photograph the playground equipment.

The evaluation manual contained criteria which the investigators used to assess the equipment (see Appendix A for details). The investigators used templates and gauges to test for hazardous openings and protrusions and entrapment angles as specified in the standard. The investigators also obtained copies of consumer information which the voluntary standard requires, such as installation instructions and a playground surfacing guide.

From October 1999 through April 2000, the field investigators visited manufacturers to obtain sales and testing information and to collect the data. The display units at the manufacturers' sites (or nearby retailers) were the pieces of equipment evaluated for the monitoring program. Staff chose the piece of equipment on display with the most play activities, if more than one unit was on display, and measurements were taken according to the evaluation manual. Despite choosing the units with the greatest number of play activities, none of the manufacturers had a unit that had all the items in the evaluation manual.

CPSC staff reviewed the completed assessments to determine whether the equipment was in conformance with the selected voluntary standard criteria.

III. RESULTS

The investigators visited all 32 home playground equipment manufacturers. Four manufacturers did not provide sales information; two of these produced molded plastic home playground equipment and two produced metal or wood home playground equipment. The molded plastic equipment is different in both design and intended users; therefore, this information is presented separately from the information on the two wood or metal playground manufacturers that did not provide sales information. For the remaining 28 manufacturers that provided sales information, the annual sales figures were used to distinguish between the major manufacturers that control the market and those smaller manufacturers that comprise a small fraction of the home playground market.

For each grouping of manufacturers, the results are presented in six different tables, corresponding to the sections of the evaluation manual and an overall conformance rating. The first five results tables are organized according to the hazard presented by non-conformance to the voluntary standard. These hazards can be seen as the heading in each results table. The shaded blocks represent an evaluation item that was not applicable to the particular piece of playground equipment. The sixth table is the overall conformance rating. This rating is based on the number of conforming evaluation items on the particular piece of equipment in relation to the total number of applicable evaluation items for that piece of equipment. This rating is only the conformance to those items that were evaluated during the study, not conformance to the voluntary standard in its entirety.

A. Manufacturers with Known Sales Figures

Major Home Playground Equipment Manufacturers (over 10,000 units sold/year)

The manufacturers in Tables A1 through A6 are the five major manufacturers of home playground equipment in the United States. The yearly sales for each of the manufacturers (as reported by the individual manufacturers) exceeds 10,000 units. According to the manufacturers' sales figures, they sell a combined total of approximately 1,024,000 units of metal and wood home playground equipment each year. Due to lack of sales information on the specific models measured in the monitoring program, staff is unable to estimate the proportion of the specific models' sales in relation to the total yearly sales for these five manufacturers.

Each of the manufacturers presented a copy of the ASTM voluntary standard F1148 for home playground equipment.

Table A1.

SPACES AND OPENINGS: HEAD ENTRAPMENT AND STRANGULATION								
	Ladder Spaces		Railing/Barrier Space		Angle Spaces			
	Between rungs	Between rung and platform	Between posts	Between R/B and platform	Upright "V" spaces	Braces on A-frames	Non-rigid openings	Ropes
Manufacturer A	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Manufacturer B	Pass	Pass			Pass			
Manufacturer C	Pass	Pass	Pass	Pass	Pass	Pass	***Fail***	Pass
Manufacturer D	Pass	Pass	Pass	Pass	Pass		Pass	Pass
Manufacturer E	Unk.	Pass		Pass				Pass

Table A2.

FALL HAZARDS: FRACTURES/CONCUSSIONS					
	Platform Railings and Barriers				
	30" to 48" platform railing	>48" to 72" platform barrier	Over 72" platform barrier	Slide railing and barrier	Climbing event grip width
Manufacturer A	Pass	Pass	Pass	Pass	Pass
Manufacturer B				Pass	
Manufacturer C	Pass			Pass	Pass
Manufacturer D		Pass		Pass	Pass
Manufacturer E	Pass	Pass	Pass	Pass	Pass

Table A3.

PROTRUSIONS: LACERATIONS AND IMPALEMENTS			
	Sideways/downwards nuts and bolts	Upward nuts and bolts	Protrusions on slides
Manufacturer A	Pass		Pass
Manufacturer B	***Fail***	Pass	Pass
Manufacturer C	Pass	Pass	Pass
Manufacturer D	Pass	Pass	Pass
Manufacturer E	Pass	Pass	

Table A4.

IMPACT BY COMPONENTS: HEAD INJURIES			
	Spacing between single swing and adjacent support	Spacing between multiple occupancy swing and adjacent support	Spacing between see-saw/horse ride and support
Manufacturer A	Pass		
Manufacturer B	Pass	Pass	
Manufacturer C	Pass		Pass
Manufacturer D	Pass		
Manufacturer E			

Table A5.

CONSUMER INFORMATION IS PROVIDED: HAZARD PREVENTION			
	Installation instruction	Playground surfacing guide	Manufacturer information
Manufacturer A	Pass	Pass	Pass
Manufacturer B	Pass	Pass	Pass
Manufacturer C	Pass	Pass	*Fail*
Manufacturer D	Pass	Pass	Pass
Manufacturer E	Pass	Pass	Pass

Table A6.

CONFORMANCE RATE FOR SELECTED EVALUATION ITEMS	
Manufacturer A	100%
Manufacturer B	92%
Manufacturer C	89%
Manufacturer D	100%
Manufacturer E	100%

Source: Home Playground Conformance Monitoring Program, CPSC 1999-2000.

Manufacturer A

Manufacturer A sells approximately 72,000 wood home playground equipment units annually. Nineteen evaluation items were applicable to the piece of equipment assessed during the investigation. Manufacturer A was 100% in conformance for the selected evaluation items for this model of home playground equipment.

Manufacturer B

Manufacturer B sells approximately 200,000 units of home playground equipment annually. The model that was the subject of the investigation was the only unit in the monitoring program that had a multiple occupancy swing. The manufacturer had one item of non-conformance to the voluntary standard. The equipment had 6 nuts that extended slightly beyond the gauges. These nuts were located below the top support bar on the brackets holding the multiple occupancy swing. This one failure out of 13 applicable evaluation items yielded a conformance rate of 92% for this model of the Manufacturer B home playground equipment.

Manufacturer C

Manufacturer C, a manufacturer of over 600,000 home playground units annually, did not conform with the voluntary standard on two of the evaluation items. The unit measured in the investigation was a wooden piece of equipment. The first failure was with the top row of the cargo net. This top row was 3/4 of an inch too small and the test head probe would not fit through the space creating an entrapment hazard. The model also did not have the manufacturer's name on it. The two items of non-conformance were out of 18 applicable items; thus Manufacturer C was 89% in conformance for the selected evaluation items from the voluntary standard on this model of equipment.

Manufacturer D

Manufacturer D produces wood home playground equipment, selling approximately 15,000 units per year. The piece of equipment measured in the investigation was in full conformance to the selected evaluation items from the voluntary standard.

Manufacturer E

Manufacturer E sells approximately 130,000 units annually. Of the 13 applicable items measured, all 13 were in full conformance for the selected evaluation items.

To arrive at a conformance rate for the five models of these major manufacturers, staff summed the number of non-conforming areas of measurement as well as the total number of applicable areas of measurement for the five models. Over the five models, there were four items that did not meet the conditions of the voluntary standard and a total of 80 applicable evaluation items. This yielded a conformance rate of 96% for the models investigated from these five major home playground equipment manufacturers.

Smaller Home Playground Equipment Manufacturers (under 10,000 units sold/year)

The manufacturers in Tables A7 through A12 are many of the minor home playground equipment manufacturers in the country. Their sales records presented during the investigation showed that each sold less than 10,000 units annually. The 23 manufacturers sell a combined total of approximately 36,000 home playground equipment units a year.

Of the 23 minor home playground equipment manufacturers, 11 of the manufacturers presented a copy of ASTM voluntary standard F1148 to the field investigator.

Table A7.

SPACES AND OPENINGS: HEAD ENTRAPMENT AND STRANGULATION								
	Ladder Spaces		Railing/Barrier Space		Angle Spaces			
	Between rungs	Between rung and platform	Between posts	Between R/B and platform	Upright "V" spaces	Braces on A-frames	Non-rigid openings	Ropes
Manufacturer F	Pass	Pass		Pass	Pass			
Manufacturer G	***Fail***	***Fail***	Pass	Pass	Pass			
Manufacturer H	Pass	***Fail***	***Fail***	Pass	***Fail***	Pass		Pass
Manufacturer I	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Manufacturer J	***Fail***	***Fail***	Pass	Pass	***Fail***			
Manufacturer K	Pass	Pass	Pass	Pass			Pass	***Fail***
Manufacturer L	***Fail***	***Fail***	Pass	Pass	Pass			
Manufacturer M	Pass	Pass	Pass	Pass	Pass	Pass		
Manufacturer N	Pass	Pass	Pass					***Fail***
Manufacturer O	Pass	***Fail***	***Fail***	Pass			***Fail***	Pass
Manufacturer P	***Fail***	***Fail***	***Fail***	***Fail***				***Fail***
Manufacturer Q	Pass	Pass	Pass	Pass		Pass		
Manufacturer R	Pass	***Fail***	Pass	Pass	Pass		Pass	Pass
Manufacturer S	***Fail***	***Fail***	Pass		***Fail***	***Fail***	Pass	***Fail***
Manufacturer T	***Fail***	Pass	***Fail***	Pass	***Fail***	Pass		
Manufacturer U	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Manufacturer V	Pass		Pass	Pass		Pass		***Fail***
Manufacturer W	Pass	Pass	Pass	Pass			Pass	***Fail***
Manufacturer X	Pass	Pass	Pass	***Fail***				***Fail***
Manufacturer Y	***Fail***	***Fail***	***Fail***		***Fail***	***Fail***	Pass	Pass
Manufacturer Z	Pass	Pass	Pass			Pass	Pass	Pass
Manufacturer AA	***Fail***	***Fail***	Pass	***Fail***	Pass			
Manufacturer BB	Pass	Pass	Pass	Pass		Pass	Pass	Pass

Table A8.

FALL HAZARDS: FRACTURES/CONCUSSIONS					
	Platform Railings and Barriers				
	30" to 48" platform railing	>48" to 72" platform barrier	Over 72" platform barrier	Slide railing and barrier	Climbing event grip width
Manufacturer F		*Fail*		Pass	Pass
Manufacturer G	Pass	Pass		Pass	Pass
Manufacturer H	Pass	Pass	Pass	Pass	Pass
Manufacturer I	Pass	Pass	Pass	Pass	Pass
Manufacturer J		*Fail*		Pass	Pass
Manufacturer K	Pass	*Fail*	Pass	Pass	Pass
Manufacturer L	Pass			Pass	
Manufacturer M	Pass			Pass	Pass
Manufacturer N		Pass		Pass	Pass
Manufacturer O		*Fail*		Pass	Pass
Manufacturer P		Pass	*Fail*	Pass	Pass
Manufacturer Q		*Fail*		Pass	Pass
Manufacturer R		*Fail*		Pass	Pass
Manufacturer S		*Fail*		Pass	Pass
Manufacturer T		*Fail*		Pass	Pass
Manufacturer U	Pass	Pass			
Manufacturer V	Pass			Pass	Pass
Manufacturer W		Pass		Pass	Pass
Manufacturer X	Pass			Pass	Pass
Manufacturer Y	*Fail*			Pass	Pass
Manufacturer Z		Pass	Pass	Pass	Pass
Manufacturer AA		Pass		Pass	Pass
Manufacturer BB		Pass		Pass	Unk.

Table A9.

PROTRUSIONS: LACERATIONS AND IMPALEMENTS			
	Sideways/downwards nuts and bolts	Upward nuts and bolts	Protrusions on slides
Manufacturer F	***Fail***	Pass	Pass
Manufacturer G	***Fail***	Pass	
Manufacturer H	Pass		Pass
Manufacturer I	Pass	Pass	Pass
Manufacturer J	Pass	***Fail***	***Fail***
Manufacturer K	Fail	Pass	Pass
Manufacturer L	Pass	Pass	Pass
Manufacturer M	Pass	***Fail***	Pass
Manufacturer N	Pass	***Fail***	
Manufacturer O	Pass	Pass	Pass
Manufacturer P	Pass	***Fail***	***Fail***
Manufacturer Q	***Fail***	***Fail***	
Manufacturer R	***Fail***		
Manufacturer S	***Fail***		Pass
Manufacturer T	Pass		
Manufacturer U	Pass	Pass	Pass
Manufacturer V	Pass	Pass	Pass
Manufacturer W	Pass	***Fail***	Pass
Manufacturer X	Pass		
Manufacturer Y	***Fail***	Pass	Pass
Manufacturer Z	Pass		Pass
Manufacturer AA	Pass	Pass	Pass
Manufacturer BB	Pass		Unk.

Table A10.

IMPACT BY COMPONENTS: HEAD INJURIES			
	Spacing between single swing and adjacent support	Spacing between multiple occupancy swing and adjacent support	Spacing between see-saw/horse ride and support
Manufacturer F	Pass		
Manufacturer G	Pass		
Manufacturer H	Pass		Pass
Manufacturer I	Pass		Pass
Manufacturer J	Pass		
Manufacturer K	Pass		Pass
Manufacturer L	Pass		
Manufacturer M	Pass		
Manufacturer N	Pass		
Manufacturer O	Pass		Pass
Manufacturer P			
Manufacturer Q	Pass		Pass
Manufacturer R			
Manufacturer S	Pass		
Manufacturer T	Pass		
Manufacturer U	Pass		
Manufacturer V	Pass		Pass
Manufacturer W	Pass		
Manufacturer X	Pass		
Manufacturer Y	Pass		Pass
Manufacturer Z	Pass		
Manufacturer AA	Pass		
Manufacturer BB	Unk.		

Table A11.

CONSUMER INFORMATION IS PROVIDED: HAZARD PREVENTION			
	Installation instruction	Playground surfacing guide	Manufacturer information
Manufacturer F	Pass	Pass	Pass
Manufacturer G	Pass	Pass	***Fail***
Manufacturer H	Pass	***Fail***	Pass
Manufacturer I	Pass	Pass	Pass
Manufacturer J	Pass	***Fail***	Pass
Manufacturer K	Pass	Pass	Pass
Manufacturer L	Pass	***Fail***	***Fail***
Manufacturer M	Pass	Pass	Pass
Manufacturer N	Pass	Pass	Pass
Manufacturer O	Pass	***Fail***	Pass
Manufacturer P	***Fail***	***Fail***	Pass
Manufacturer Q	Pass	Pass	***Fail***
Manufacturer R	Pass	***Fail***	***Fail***
Manufacturer S	Pass	***Fail***	***Fail***
Manufacturer T	Pass	Pass	Pass
Manufacturer U	Pass	Pass	Pass
Manufacturer V	Pass	Pass	Pass
Manufacturer W	***Fail***	***Fail***	***Fail***
Manufacturer X	Pass	Pass	***Fail***
Manufacturer Y	***Fail***	***Fail***	***Fail***
Manufacturer Z	Pass	Pass	Pass
Manufacturer AA	Pass	***Fail***	***Fail***
Manufacturer BB	Pass	Pass	***Fail***

Table A12.

CONFORMANCE RATE FOR SELECTED EVALUATION ITEMS	
Manufacturer F	86%
Manufacturer G	73%
Manufacturer H	79%
Manufacturer I	100%
Manufacturer J	53%
Manufacturer K	84%
Manufacturer L	71%
Manufacturer M	94%
Manufacturer N	85%
Manufacturer O	71%
Manufacturer P	33%
Manufacturer Q	73%
Manufacturer R	64%
Manufacturer S	44%
Manufacturer T	71%
Manufacturer U	100%
Manufacturer V	94%
Manufacturer W	69%
Manufacturer X	77%
Manufacturer Y	47%
Manufacturer Z	100%
Manufacturer AA	67%
Manufacturer BB	92%

Source: Home Playground Conformance Monitoring Program, CPSC 1999-2000

Manufacturer F

Manufacturer F sells approximately 1,000 units of home playground equipment a year. This manufacturer did not present a copy of the ASTM voluntary standard to the field investigator. There were two evaluation items on the model equipment evaluated that did not meet the specifications of the voluntary standard. A platform measuring 61 and 1/4 inches had a 25 and 1/4 inch guardrail as opposed to a 27 inch barrier as required in the voluntary standard. The equipment also had sideways facing bolts that extended 1/4 of an inch beyond the measurement gauges. Fourteen evaluation items applied to components on this piece of playground equipment. Manufacturer F had an overall conformance rate of 86% for the selected evaluation items for this model of their equipment.

Manufacturer G

Manufacturer G sells 300 units of home playground equipment in a year. The manufacturer presented a copy of the ASTM voluntary standard at the time of the investigation. The piece of equipment exhibited non-conformance to the voluntary standard on four evaluation items. The spacing between rungs on the arch climber was 1/4 of an inch too small. Additionally, a space between the bottom rung of a ladder and a sand box was over 3 inches too small. The spacing problems create head entrapment hazards. The equipment also had sideways and downward facing bolts that extended beyond the measurement gauges. The final item of non-conformance was with consumer information. The manufacturer's name and contact information

was not located on the piece of equipment. These four problems yielded a 73% conformance rate for this particular model of home playground equipment.

Manufacturer H

Manufacturer H sells over 3,000 pieces of home playground equipment a year. The manufacturer presented a copy of the ASTM voluntary standard; however, the version was one published in 1993 and did not have the most recent additions to the standard. The model that was measured during the investigation showed four evaluation items that did not conform with the voluntary standard. The space between the top rung of the ladder and the spaces between some railings on a platform barrier both measured 3 and 3/4 inches. This allows the test probe to pass through but not the test head probe creating a head entrapment hazard. Another entrapment hazard was presented with upright "V" angles that measured less than 55°. The final problem was that the manufacturer did not provide a safe playground surfacing guide with the consumer information. Manufacturer H, therefore had a 79% (15 of 19 applicable evaluation items) conformance rate for this particular model of home playground equipment.

Manufacturer I

Manufacturer I sells nearly 5,000 pieces of home playground equipment annually. The company showed the investigator the most recently published copy of ASTM standard F1148, and the model evaluated during the investigation conformed with all applicable evaluation items. The manufacturer's model of home playground equipment was in full conformance for the selected evaluation items of the voluntary standard.

Manufacturer J

Manufacturer J sells under 500 units of home playground equipment annually. Manufacturer J did not have a copy of the home playground ASTM voluntary standard. The particular model used during the investigation had activities and components applying to 15 evaluation items. Seven of these evaluation items failed to conform with the voluntary standard. The ladder spaces, both between rungs and between the top rung and the platform, presented entrapment hazards. The spaces allowed the test torso probe to pass through, but did not allow the test head probe to pass. The piece of equipment also had upright "V" angles that measured 30° as opposed to the required 55° angle stated in the voluntary standard. The wood platform was 70 inches off the ground, thus requiring a 27 inch barrier; however, this equipment had guardrails that were only 26 inches high. The company had a revised barrier, but this barrier had a vertical railings that posed a head entrapment hazard. The equipment had upward facing nuts and bolts that extended over 1/8 of an inch beyond the test gauges. The slide also had protrusions that extended more than 1/8 of an inch above the slide surface. Finally, the manufacturer did not include a safe playground surfacing guide with the consumer information. Manufacturer J yielded a 53% conformance rate to the selected evaluation items for this particular model of home playground equipment.

Manufacturer K

Manufacturer K sells approximately 1,000 units of home playground equipment per year. The piece of equipment reviewed during the investigation was a composite structure consisting of the four different sections of equipment that the company manufactures. The manufacturer presented a copy of the ASTM standard at the time of the investigation. The equipment showed three areas of failure out of 19 applicable evaluation items. The equipment had a 7 foot climbing rope that was neither anchored nor had instructions to anchor both ends of the rope. The 54 inch high platforms had barriers measuring 24 inches as opposed to the voluntary standard's 27 inch height requirement. Lastly, there were sideways and downward facing nuts and bolts on the equipment that extended beyond the measurement gauges. Three failures out of 19 evaluation items produced a conformance rate of 84% for Manufacturer K on the composite structure playground equipment.

Manufacturer L

Manufacturer L sells 200 units of home playground equipment annually. The company presented the ASTM standard. The spacing, both between the ladder rungs and between the top rung and the platform was large enough to allow the test torso template to pass through, but too small for the head template to pass, by approximately 1 inch and 2 inches, respectively. The other two areas of non-conformance to the standard were with the consumer information. Manufacturer L did not provide a safe surfacing guide nor was the manufacturer's name and contact information located on the piece of equipment. Therefore, Manufacturer L had a 71% conformance rate for the selected evaluation items for this model of home playground equipment.

Manufacturer M

Manufacturer M sells approximately 1,200 units of home playground equipment per year. The manufacturer did not present a copy of the ASTM voluntary standard to the investigator. The model of equipment examined had one failure out of 16 applicable evaluation items. On the beam holding the swings, there were upward facing bolts that extended 3/4 of an inch beyond the test gauge. This model of Manufacturer M home playground equipment yielded a 94% conformance rate.

Manufacturer N

Manufacturer N sells approximately 4,000 pieces of home playground equipment per year. Although the manufacturer presented a copy of the ASTM standard, it was a 1993 published version and did not contain the updated requirements. The model of equipment assessed during the investigation revealed two failed evaluation items out of 13 applicable items. The instructions for the model of equipment did not include instructions to secure both ends of the climbing ropes and there were upward facing bolts that extended more than 1/8 inch beyond the test gauges. These bolts were located on the beam holding the swings. This model of Manufacturer N home playground equipment was 85% in conformance for the selected evaluation items.

Manufacturer O

Manufacturer O sells about 150 pieces of home playground equipment annually. The company did not have a copy of the ASTM voluntary standard and had five items of non-conformance on the model piece of equipment that was evaluated. Three entrapment hazards were found: a 5 and 1/4 inch space between the top ladder rung and the platform to which the ladder led, 7 and 1/2 inch spaces between the posts on the platform barrier and the 5 to 7 inch spaces in the cargo net. All these measurements are such that the test torso probe could pass through but not the test head probe. In addition to these entrapment hazards, the platform barrier was too short, posing a fall hazard. Lastly, the manufacturer failed to include a safe playground surfacing guide with the consumer information. The five failures out of 17 applicable evaluation items showed a 71% conformance rate to the selected evaluation items for this model of Manufacturer O home playground equipment.

Manufacturer P

Manufacturer P sells less than 100 pieces of playground equipment per year. The company did not have a copy of the ASTM voluntary standard. Of 15 applicable evaluation items for the particular model of equipment reviewed during the investigation, 10 items failed to conform with the voluntary standard. Both the spaces in between the ladder rungs and the space between the top rung of the ladder and the platform ranged from 5 to 7 inches creating entrapment hazards. The platform barrier spaces were entrapment hazards also, both between posts on the platform and between the platform itself and the bottom of the barrier. There were no directions to secure both ends of the climbing ropes. The platform barrier was 1/4 of an inch under the requirement in the voluntary standard. The upward facing nuts and bolts and the hardware on the slide were protrusion hazards. Neither the installation instructions nor a safe playground surfacing guide was provided for the consumer. These problems yielded a 33% conformance rate for the selected evaluation items for this piece of Manufacturer P home playground equipment.

Manufacturer Q

Manufacturer Q sells approximately 700 units of home playground equipment a year. The manufacturer presented a copy of the ASTM standard. It had four failing items on the piece of equipment looked at during the investigation. The platform, which was 59 inches high, had a barrier measuring almost 24 inches as opposed to the voluntary standard requirement of 27 inches. The swing glider had long bolts that protruded to the side and there were bolts on the top of the beam holding the swings that extended more than 1/8 of an inch beyond the measurement gauge. The manufacturer's name and contact information were not provided on the piece of equipment examined. Out of 15 applicable evaluation items, this model of Manufacturer Q home playground equipment had a 73% conformance rate.

Manufacturer R

Manufacturer R sells approximately 50 pieces of equipment annually. The company did not have a copy of the ASTM voluntary standard. Manufacturer R exhibited five failures out of 14 applicable evaluation items for the particular playground equipment model. The spacing between the top rung of the ladder and the platform posed a head entrapment hazard. The platform on the equipment was 58 and 1/2 inches off the ground, thus requiring a 27 inch barrier; however, the barrier on the equipment was only 20 inches tall. The equipment had sideways and downward facing nuts and bolts that extended beyond the measurement gauges. Manufacturer R also failed to provide a safe playground surfacing guide and to put its name and contact information on its product. These failures yielded a conformance rate of 64% for the selected evaluation items for this model of Manufacturer R.

Manufacturer S

Manufacturer S sells over 8,000 pieces of home playground equipment annually. The company presented the CPSC field investigator with a copy of the ASTM voluntary standard. Of 16 applicable evaluation items, nine did not conform to the voluntary standard. Both the spaces between the ladder rungs and between the top ladder rung and the platform posed an entrapment hazard. The hazard is present in these spaces because the test torso probe can fit through the space, but the test head probe could not. Other entrapment hazards included upright "V" angles that were too small, lack of braces on A-frames to eliminate small angles and climbing ropes that did not have directions to secure them at both ends. The barrier on the 70 inch high platform was 24 inches instead of the 27 inch required height. There were sideways and downward facing nuts and bolts that protruded beyond the measurement gauges. Manufacturer S did not provide a safe playground surfacing guide and did not put its name and contact information on the equipment. This particular model of Manufacturer S home playground equipment had a 44% conformance rate for the selected evaluation items.

Manufacturer T

Manufacturer T sells 750 pieces of home playground equipment a year. The manufacturer did not provide the field investigator with a copy of the ASTM voluntary standard. Manufacturer T had three entrapment hazards on the particular model of equipment evaluated: 6 and 1/2 inch spaces between ladder rungs and 6 inch spaces between posts on the platform barrier, both of which allowed passage of the torso probe but not the head probe, and the upright "V" spaces that were less than the required 55° angle. In addition, the 21 inch barrier on the platform, measuring 60 inches high, failed to meet the voluntary requirements by 6 inches. These four failures out of an applicable 14 evaluation items produced a 71% conformance rate for this model of Manufacturer T.

Manufacturer U

Manufacturer U sells approximately 1,000 pieces of home playground equipment a year. The manufacturer did not have a copy of the ASTM voluntary standard. The model evaluated

had components that applied to 17 evaluation items and all of them complied to the standard's specifications, yielding a 100% conformance rate for those selected items.

Manufacturer V

Manufacturer V sells approximately 250 pieces of home playground equipment a year. The manufacturer did not have a copy of the ASTM voluntary standard. Of 16 applicable evaluation items, the model evaluated exhibited one failure, instructions to secure the climbing rope at both ends to avoid strangulation were not provided. This model of Manufacturer V had a 94% conformance rate for the selected evaluation items of the home playground voluntary standard.

Manufacturer W

Manufacturer W sells close to 500 pieces of home playground equipment per year. The playground equipment manufacturer showed the investigator a copy of the ASTM voluntary standard, but the standard was an older version, missing some of the latest revisions. Manufacturer W had five failing evaluation items out of an applicable 16. The company did not provide instructions to anchor both ends of the climbing ropes. The model piece of equipment had upward facing bolts that extended more than 1/2 inch beyond the surface of the equipment. Installation instructions and a safe playground surfacing guide were not included with the consumer information and the manufacturer name and contact information was not on the product. This model of Manufacturer W home playground equipment had a 69% conformance rate for the selected evaluation items of the voluntary standard.

Manufacturer X

Manufacturer X, selling approximately 350 units of home playground equipment a year, did not provide the field investigator with the ASTM voluntary standard. The equipment had components that applied to 13 of the evaluation items; three items did not meet the specifications of the standard. The space between the last rung on the monkey bars and the platform of the monkey bars was too small to allow passage of the test head probe, but allowed passage of the test torso probe, creating an entrapment hazard and there were no instructions to secure both ends of the climbing rope. Manufacturer X also did not put its name and contact information on the playground equipment. These three failures give this model of Manufacturer X home playground equipment a conformance rate of 77% for the selected evaluation items.

Manufacturer Y

Manufacturer Y sells 800 pieces of home playground equipment in a year. The manufacturer was unaware of the ASTM voluntary standard for home playground equipment. The model that was measured during the investigation revealed 10 failures of an applicable 19 evaluation items. The spacing between the ladder rungs measured almost 7 inches and the distance between the top ladder rung and the platform was just under 4 inches. Both measurements permitted passage of the test torso probe but not the test head probe creating head entrapment hazards. The equipment had upright "V" spaces and there were no braces on the A-

frames, both of which present entrapment hazards. The platform railing failed to meet the height requirement in the standard by 2 and 1/2 inches and there were sideways and downward facing nuts and bolts that were 1/4 to 1/2 an inch too long. There were no installation instructions or a safe playground surfacing guide and Manufacturer Y did not put its name and contact information on the equipment. This particular model of Manufacturer Y home playground equipment had a 47% conformance rate for the selected evaluation items of the voluntary standard.

Manufacturer Z

Manufacturer Z sells approximately 4,000 pieces of home playground equipment annually. The manufacturer did present a copy of the ASTM voluntary standard. Of the 16 applicable evaluation items, the equipment met the standard's specifications on all of them, thus yielding a 100% conformance rate for those selected items.

Manufacturer AA

Manufacturer AA sells 200 units of home playground equipment annually and did not have the ASTM voluntary standard to show the CPSC field investigator. The manufacturer failed to meet the requirements of the voluntary standard in five of the 15 applicable evaluation items. Multiple ladders had incorrect spacing, measuring between 8 and 9 inches, large enough to pass the test torso probe through but too small for the test head probe to pass through. The spaces between the ladder rungs and the platforms were also entrapment hazards, measuring between 4 and 8 inches. The space between the platform and the bottom of the side barriers was also approximately 8 inches creating an entrapment hazard. Manufacturer AA failed to provide information on safe playground surfacing and did not put its name and contact information on the piece of playground equipment. These five failures produced a 67% conformance rate for this particular model of Manufacturer AA home playground equipment.

Manufacturer BB

Manufacturer BB sells approximately 3,000 pieces of home playground equipment yearly. The manufacture provided the field investigator with a copy of the voluntary standard. The one failure with the piece of equipment examined during the evaluation was that the company did not put its name and contact information on the piece of equipment. Three additional evaluation items may have been applicable for this equipment; however, the equipment was not evaluated for these items. These evaluation items are noted as *unknown* in the results tables. Out of 13 applicable, and measured, evaluation items, the one failure produced a 92% conformance rate for this model of Manufacturer BB home playground equipment.

Overall, the smaller home playground equipment manufacturers had an average of 75% conformance rate to the voluntary standard for home playground equipment.

B. Manufacturers with Unknown Sales Figures

Molded Plastic Home Playground Equipment Manufacturers

Manufacturer CC and Manufacturer DD are manufacturers of molded plastic home playground equipment, a type of equipment intended for younger children. These manufacturers did not provide their sales figures. The results for these manufacturers are provided below:

Table B1.

SPACES AND OPENINGS: HEAD ENTRAPMENT AND STRANGULATION								
	Ladder Spaces		Railing/Barrier Space		Angle Spaces			
	Between rungs	Between rung and platform	Between posts	Between R/B and platform	Upright "V" spaces	Braces on A-frames	Non-rigid openings	Ropes
Manufacturer CC	Pass	Pass	Pass	Pass		Pass		
Manufacturer DD	Pass	Pass						

Table B2.

FALL HAZARDS: FRACTURES/CONCUSSIONS					
	Platform Railings and Barriers				
	30" to 48" platform railing	>48" to 72" platform barrier	Over 72" platform barrier	Slide railing and barrier	Climbing event grip width
Manufacturer CC	Pass	Pass			
Manufacturer DD	***Fail***			Pass	Pass

Table B3.

PROTRUSIONS: LACERATIONS AND IMPALEMENTS			
	Sideways/downwards nuts and bolts	Upward nuts and bolts	Protrusions on Slides
Manufacturer CC	Pass	Pass	Pass
Manufacturer DD	Pass	Pass	Pass

Table B4.

IMPACT BY COMPONENTS: HEAD INJURIES			
	Spacing between single swing and adjacent support	Spacing between multiple occupancy swing and adjacent support	Spacing between see-saw/horse ride and support
Manufacturer CC			
Manufacturer DD	Pass		

Table B5.

CONSUMER INFORMATION IS PROVIDED: HAZARD PREVENTION			
	Installation instruction	Playground surfacing guide	Manufacturer information
Manufacturer CC	Pass	Pass	Pass
Manufacturer DD	Pass	Pass	Pass

Table B6.

CONFORMANCE RATE TO SELECTED EVALUATION ITEMS	
Manufacturer CC	100%
Manufacturer DD	96%

Source: Home Playground Conformance Monitoring Program, CPSC 1999-2000.

Manufacturer CC

Upon investigation of a model of Manufacturer CC home playground equipment, there were no violations of the voluntary standard found, out of 13 applicable evaluation items. Thus this model of Manufacturer CC home playground equipment was in full conformance for the selected evaluation items of the voluntary standard.

Manufacturer DD

The investigated piece of Manufacturer DD equipment met the voluntary standard specifications for 11 of the 12 applicable evaluation items. The one failing item was the railing on a platform, which was not the proper height. This one failure resulted in a conformance rate of 92% for this model of Manufacturer DD home playground equipment.

Both manufacturers of molded plastic home playground equipment presented copies of the ASTM standard during the evaluations. The combined conformance rate for these two manufacturers of molded plastic home playground equipment was 96%.

Wooden or Metal Playground Manufacturers

Manufacturer EE and Manufacturer FF did not give their sales information. Therefore, a conclusion cannot be made as to whether these companies are major or minor home playground manufacturers.

Manufacturer EE and Manufacturer FF both presented a copy of the ASTM voluntary standard during the investigation.

Table B7.

SPACES AND OPENINGS: HEAD ENTRAPMENT AND STRANGULATION								
	Ladder Spaces		Railing/Barrier Space		Angle Spaces			
	Between rungs	Between rung and platform	Between posts	Between R/B and platform	Upright "V" spaces	Braces on A-frames	Non-rigid openings	Ropes
Manufacturer EE	Pass	Pass	Pass	Pass	[redacted]	[redacted]	[redacted]	[redacted]
Manufacturer FF	Pass	Pass	Pass	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Table B8.

FALL HAZARDS: FRACTURES/CONCUSSIONS					
	Platform Railings and Barriers				
	30" to 48" platform railing	>48" to 72" platform barrier	Over 72" platform barrier	Slide railing and barrier	Climbing event grip width
Manufacturer EE	Unk.	Unk.	Unk.	Pass	Pass
Manufacturer FF	[redacted]	Pass	[redacted]	Pass	[redacted]

Table B9.

PROTRUSIONS: LACERATIONS AND IMPALEMENTS			
	Sideways/downwards nuts and bolts	Upward nuts and bolts	Protrusions on Slides
Manufacturer EE	Pass	Pass	Pass
Manufacturer FF	Pass	Pass	Pass

Table B10.

IMPACT BY COMPONENTS: HEAD INJURIES			
	Spacing between single swing and adjacent support	Spacing between multiple occupancy swing and adjacent support	Spacing between see-saw/horse ride and support
Manufacturer EE	[redacted]	[redacted]	[redacted]
Manufacturer FF	Pass	[redacted]	[redacted]

Table B11.

CONSUMER INFORMATION IS PROVIDED: HAZARD PREVENTION			
	Installation Instruction	Playground surfacing guide	Manufacturer information
Manufacturer EE	Pass	Pass	***Fail***
Manufacturer FF	Pass	Pass	Pass

Table B12.

CONFORMANCE RATE FOR SELECTED EVALUATION ITEMS	
Manufacturer EE	92%
Manufacturer FF	100%

Source: Home Playground Conformance Monitoring Program, CPSC 1999-2000

Manufacturer EE

Manufacturer EE had one failure on the evaluated model of home playground equipment. The manufacturer's name and contact information was not provided on the piece of equipment.

Three additional evaluation items may have been applicable for this equipment; however, the equipment was not assessed for these items. These evaluation items are noted as *unknown* in the results tables. Out of 12 applicable and measured evaluation items, the one failure yields a 92% conformance rate.

Manufacturer FF

The investigated piece of equipment for Manufacturer FF complied with the standard's specification on all of the 12 applicable evaluation items. The model of Manufacturer FF home playground equipment was in full conformance for the selected evaluation items of the standard.

IV. CONCLUSIONS

Sales Figures

From the information provided during the monitoring program, staff estimates that these 32 manufacturers sell at least 1,060,000 home playground units a year. This is an estimate based on the 28 manufacturers that provided sales information. It is a minimum figure since sales information was not obtained for four of the manufacturers. The sales total for the five major manufacturers listed in section B is 1,024,000, almost 97% of the total sales figure. The remaining 3% of the home playground equipment produced by manufacturers in the monitoring program were from smaller manufacturers. Over 99% of the home playground sets sold were made by manufacturers that presented the ASTM standard during the monitoring program.

Conformance Rates

All conformance rates discussed below are calculated for the particular model investigated in the monitoring program. The rates are based on how many activities and components of the equipment met the specifications of the voluntary standard for the selected evaluation items. Not all playground equipment had activities and components that were listed in the evaluation manual. The conformance rates were based only on those evaluation items that were applicable and evaluated during the investigations.

For the 28 manufacturers for which sales information was available, the chosen models from the major manufacturers had an overall conformance rate of 96% to the selected evaluation items. This compares to the overall conformance rate of 75% to the selected evaluation items for the model equipment of the smaller manufacturers. These conformance rates are the average of each manufacturer's conformance to the voluntary standard within the two groups of major and minor home playground equipment manufacturers.

Another valuable comparison is that of manufacturers who presented copies of the ASTM voluntary standard F1148 to those manufacturers that did not have a copy of the standard. Of the 32 manufacturers, 20 of them provided copies of the standard, either old or new versions. The conformance rate for those 20 manufacturers averaged 87%. The remaining 12 manufacturers that did not have the ASTM standard had an average conformance rate of 71%. Thus, those

manufacturers who appeared knowledgeable about the voluntary standard (i.e. they had a copy of the standard) had a higher conformance rate than those who did not have a copy of the standard.

Individual Evaluation Item Conformance

Table IV on the following page describes the conformance for the individual evaluation items. The table further breaks down the conformance rates for all manufacturers and those that presented the ASTM voluntary standard.

The right hand column of the table gives an overview of the percentage of manufacturers that conformed with each of the listed evaluation items. For instance, for Spaces Between Ladder Rungs, 74% of the manufacturers that had spaces in between the rungs of the ladders on the inspected equipment had the correct spacing, thus preventing a head entrapment hazard. All but six evaluation items had at least one manufacturer fail to conform to the ASTM voluntary standard. The six areas with full conformance were the multiple occupancy swing spacing, slide railings and barriers, climbing event grip width, spacing between the single swing and the adjacent support, spacing between the multiple occupancy swing and adjacent support and spacing between the see-saw swing and horse ride and their adjacent supports. The areas with the least conformance were the manufacturer name and contact information being located on the piece of home playground equipment and instructions to anchor climbing ropes.

The middle column of the table shows the percentage of conformance for the manufacturers that presented ASTM standards. For instance, 84% of the manufacturers that had ASTM standards met the specifications for the spaces between the ladder rungs. The number of evaluation items with full conformance increases from six to nine for the manufacturers with ASTM standards. In addition to the six evaluation items previously mentioned with full manufacturer conformance, the manufacturers with ASTM standards fully complied with the specifications for the spaces between the platforms and barriers, the height of the platform barriers for barriers over 72" and protrusions on slides. The area of least conformance among the manufacturers that showed ASTM standards was, again, that the manufacturer name and contact information were not on the piece of equipment.

Table IV.

	Manufacturers Presenting ASTM Standard			All Manufacturers		
Evaluation item	# of Manufacturers Complied with Standard	Total # Manufacturers with Applicable Equipment	%	# of Manufacturers Complied with Standard	Total # of Manufacturers with Applicable Equipment	%
Spaces between ladder rungs	16	19	84	23	31	74
Spaces between top ladder rung and platform	15	20	75	21	31	68
Spaces between posts on platform barrier	16	17	94	22	28	79
Spaces between platform and Barrier	14	14	100	22	25	88
Upright "V" Spaces	7	9	78	12	17	71
Braces on A-frames	8	9	89	12	14	86
Non-Rigid Openings	8	9	89	11	13	85
Lawn Swing Spacing	1	1	100	1	1	100
Anchoring Ropes	8	12	67	12	19	63
Platform Railings and Barriers (height between 30" and 48")	9	10	90	13	15	87
Platform Railings and Barriers (height between 48" and 72")	12	15	80	15	23	65
Platform Railings and Barriers (height above 72")	6	6	100	6	7	86
Slide Railings and Barriers	19	19	100	30	30	100
Climbing Event Grip Width	15	15	100	26	26	100
Sideways/Downward Facing Nuts and Bolts	15	20	75	24	32	75
Upward Facing Nuts and Bolts	12	15	80	18	24	75
Protrusions on Slides	15	15	100	22	24	92
Spacing Between Single Swing and Adjacent Support	16	16	100	26	26	100
Spacing Between Multiple Occupancy Swing & Support	1	1	100	1	1	100
Spacing Between See-Saw Swing/Horse Ride & Support	4	4	100	7	7	100
Installation Instructions	19	20	95	29	32	91
Safe Playground Surfacing Guide	16	20	80	22	32	69
Manufacturer Name and Contact Information	12	20	60	20	32	63

Source: Home Playground Conformance Monitoring Program, CPSC 1999-2000

APPENDIX A

Evaluation manual Key

This document lists the areas of the playground equipment that the investigators examined and measured for conformance to ASTM voluntary standard F1148-98c. The specifications listed below are what the standard requires. If the specification below is not met on the equipment measured, the piece of equipment fails the voluntary standard for that evaluation item. If there are multiple spaces to measure, or protrusions to measure, all spaces and protrusions must meet the specification of the standard in order to pass; if any of the spaces or protrusions do not meet the standard, the piece of equipment fails the voluntary standard for that evaluation item.

SPACES AND OPENINGS: HEAD ENTRAPMENT AND STRANGULATION

1. Ladder Spaces
   a. Spaces between rungs - both the head template and the torso template must pass through these spaces or neither of the templates should pass through these spaces.
   b. Space between the top rung and the platform - both the head template and the torso template must pass through this space or neither of the templates should pass through this space.
2. Platform Railings and Barrier Spaces
   a. Spaces between the railings and posts - both the head template and the torso template must pass through these spaces or neither of the templates should pass through these spaces.
   b. Spaces between the platform and the railing or barrier - both the head template and the torso template must pass through these spaces or neither of the templates should pass through these spaces.
3. Angle Spaces
   a. Upright "V" spaces - this angle must be greater than 55°. The angle on the equipment should be larger than the angle template.
   b. Braces on A-frame - if the angle is less than 55°, it should be filled so that the head template does not fit in the angle or touch the support bars.
4. Non-Rigid Openings (e.g. cargo net) - both the head template and the torso template must pass through these spaces or neither of the templates should pass through these spaces.
5. Lawn Swing Spaces[1]
   a. Space between the seat and backrest - space shall not be over 3 inches.
   b. Space between the seat and footrest - space shall not be over 10 inches.
   c. Space between the seat and armrest - both the head template and the torso template must pass through these spaces or neither of the templates should pass through these spaces.
   d. Foot slats - spaces between the foot slats must be less the 1.5 inches.
6. Ropes - suspended climbing ropes, chains or cables must be secured at both ends.[2]

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[1] The results of the lawn swing spacing measurements are not included in the results tables because only one manufacturer in the monitoring program had a lawn swing on the model equipment. The results for this manufacturer are noted in the narrative.

[2] Since many of the display units were on surfaces that did not allow anchorage, the installation instructions were reviewed for instruction to anchor both ends of the ropes. If there were not instructions available, the decision was based on whether the ropes on the display unit were anchored at both ends.

FALL HAZARDS: FRACTURES/CONCUSSIONS

7. Platform Railings and Barriers
   a. For platforms between 30 inches and 48 inches - must have a railing at least 25 inches high.
   b. For platforms between 48 inches and 72 inches - must have a barrier at least 27 inches high.
   c. For platforms over 72 inches - must have a barrier at least 33 inches high.
8. Slide Railings and Barriers - must have railings or barriers on all sides of the transition area at the top of the slide, except for the entrance and the exit.
9. Ladder Rungs and Climbing Events Grip Width - must not be greater than 1.6 inches in diameter.

PROTRUSIONS: LACERATIONS AND IMPALEMENTS

10. Bolts and Nuts (facing sideways or down) - none of the bolts should extend beyond the bolt gauges.
11. Bolts and Nuts (facing upwards) - no bolts that fit into the gauges should extend beyond 1/8 inch above any surface.
12. Protrusions on Slides - shall be no protrusions more than 1/8 inch accessible to a child using the slide. A rounded surface protruding slightly beyond 1/8 inch is exempt.

IMPACT BY COMPONENTS: HEAD INJURIES

13. Spacing Between Single Swing and Adjacent Support - must be at least 7 inches from the support at 28 inches above the seat.
14. Spacing Between Multiple Occupancy Swing and Adjacent Support - must be at least 7 inches from the support at 28 inches above the seat.
15. Spacing Between See-Saw Swings and Horse Rides and Adjacent Support - must be at least 16 inches from the center of the seat to the support at 22 inches above the seat.

CONSUMER INFORMATION: HAZARD PREVENTION

16. Installation Instructions - should provide instructions for installation if necessary
17. Anchoring Instructions - should provide instructions to anchor equipment to ground if necessary.[3]
18. Playground Surfacing Guide - should have CPSC guideline for safe playground surfacing materials and depths.
19. Manufacturer, Name, City, State, Zip on Unit - should have manufacturer information and contacts fixed on the equipment.

[3] This evaluation item was eliminated from the analysis. The voluntary standard requires anchoring instructions only if necessary for that particular unit. Not all home playground equipment needs anchoring since the stability is built into the design of the equipment.