

a. ASME/ANSI A39.1—Safety Requirements for Window Cleaning. In addition to information on the design and use of window cleaner's belts and anchors, other window cleaning procedures are outlined.

2. *Marking.* It is recommended that body belts and pole straps, not designed for use with personal fall arrest systems (not meeting the requirements of § 1910.129) and all chest harnesses, be marked to indicate that they are for use only in positioning device systems.

#### Appendix B to Subpart I—References for Further Information

**Note:** The following appendix to §§ 1910.128–1910.131 of subpart I serves as a non-mandatory guideline to assist employers and employees in complying with these sections and to provide other helpful information. This appendix neither adds to nor detracts from the obligations contained in the OSHA standards.

The following references provide information which may be helpful in understanding and implementing subpart I.

1. "American National Standard Safety Requirements for Fixed Ladders," ANSI A14.3–1982. American National Standards Institute, 1430 Broadway, New York, New York 10018.
2. "American National Standard Safety Requirements for Window Cleaning," ASME/ANSI A39.1a–1988. American National Standards Institute, 1430 Broadway, New York, New York 10018.
3. Chaffin, Don B. and Terrence J. Stobbe. "Ergonomic Considerations Related to Selected Fall Prevention Aspects of Scaffolds and Ladders as Presented in OSHA Standard 29 CFR Part 1910 Subpart D." The University of Michigan, Ann Arbor, Michigan 48104, September 1979. Available from: U.S. Department of Labor, OSHA, 200 Constitution Avenue, NW., Washington, DC 20210.
4. "A Study of Personal Fall-Safety Equipment," NBSIR 76–1146. National Bureau of Standards (NBS), U.S. Department of Commerce, Washington, DC 20234. Available from: National Technical Information Service (NTIS), Springfield, Virginia 22151.
5. Sulowski, Andrew C. "Selecting Fall Arresting Systems," Pp. 55–62. "National Safety News," October 1979, National Safety Council, 425 N. Michigan Avenue, Chicago, Illinois 60611.
6. Sulowski, Andrew C. "Assessment of Maximum Arrest Force," Pp. 55–58. "National Safety News," March 1981, National Safety Council, 425 N. Michigan Avenue, Chicago, Illinois 60611.

#### Appendix C to Subpart I—Test Methods and Procedures for Personal Protective Systems

**Note:** The following appendix to §§ 1910.128–1910.131 of subpart I serves as a non-mandatory guideline to assist employers and employees in complying with these sections and to provide other helpful information. This appendix neither adds to nor detracts from the obligations contained in the OSHA standards.

This appendix contains test methods for personal fall protection systems which may

be used to determine if they meet the system performance criteria specified in §§ 1910.129 and 1910.130.

#### § 1910.129 Test methods for personal fall arrest systems.

1. *General.* The following sets forth test procedures for personal fall arrest systems as defined in § 1910.129.

2. *General test conditions.*

a. Lifelines, lanyards and deceleration devices should be attached to an anchorage and connected to the body-belt or body harness in the same manner as they would be when used to protect employees.

b. The anchorage should be rigid, and should not have a deflection greater than .04 inches (1 mm) when a force of 2,250 pounds (10 kN) is applied.

c. The frequency response of the load measuring instrumentation should be 120 HZ.

d. The test weight used in the strength and force tests should be a rigid, metal cylindrical or torso-shaped object with a girth of 38 inches plus or minus four inches (96 cm plus or minus 10 cm).

e. The lanyard or lifeline used to create the free fall distance should be supplied with the system, or in its absence, the least elastic lanyard or lifeline available to be used with the system.

f. The test weight for each test should be hoisted to the required level and should be quickly released without having any appreciable motion imparted to it.

g. The system's performance should be evaluated, taking into account the range of environmental conditions for which it is designed to be used.

h. Following the test, the system need not be capable of further operation.

3. *Strength test.*

a. During the testing of all systems, a test weight of 300 pounds plus or minus five pounds (135 kg plus or minus 2.5 kg) should be used. (See paragraph 2.d. above.)

b. The test consists of dropping the test weight once. A new unused system should be used for each test.

c. For lanyard systems, the lanyard length should be six feet plus or minus two inches (1.83 plus or minus 5 cm) as measured from the fixed anchorage to the attachment on the body belt or body harness.

d. For rope-grab-type deceleration systems, the length of the lifeline above the centerline of the grabbing mechanism to the lifeline's anchorage point should not exceed two feet (0.61 m).

e. For lanyard systems, for systems with deceleration devices which do not automatically limit free fall distance to two feet (0.61 m) or less, and for systems with deceleration devices which have a connection distance in excess of one foot (0.3 m) (measured between the centerline of the lifeline and the attachment point to the body belt or harness), the test weight should be rigged to free fall a distance of 7.5 feet (2.3 m) from a point that is 1.5 feet (46 cm) above the anchorage point, to its hanging location (six feet below the anchorage). The test weight should fall without interference, obstruction, or hitting the floor or ground during the test. In some cases a non-elastic

wire lanyard of sufficient length may need to be added to the system (for test purposes) to create the necessary free fall distance.

f. For deceleration device systems with integral lifelines or lanyards which automatically limit free fall distance to two feet (0.61 m) or less, the test weight should be rigged to free fall a distance of four feet (1.22 m).

g. Any weight which detaches from the belt or harness should constitute failure for the strength test.

4. *Force test.* a. *General.* The test consists of dropping the respective test weight specified in 4.b.(i) or 4.c.(i) once. A new, unused system should be used for each test.

b. *For lanyard systems.* (i) A test weight of 220 pounds plus or minus three pounds (100 kg plus or minus 1.6 kg) should be used. (See paragraph 2.d., above.)

(ii) Lanyard length should be six feet plus or minus two inches (1.83 m plus or minus 5 cm) as measured from the fixed anchorage to the attachment on the body belt or body harness.

(iii) The test weight should fall free from the anchorage level to its hanging location (a total of six feet (1.83 m) free fall distance) without interference, obstruction, or hitting the floor or ground during the test.

c. *For all other systems.* (i) A test weight of 220 pounds plus or minus three pounds (100 kg plus or minus 1.6 kg) should be used. (See paragraph 2.d., above.)

(ii) The free fall distance to be used in the test should be the maximum fall distance physically permitted by the system during normal use conditions, up to a maximum free fall distance for the test weight of six feet (1.83 m), except as follows:

(A) For deceleration systems which have a connection link or lanyard, the test weight should free fall a distance equal to the connection distance (measured between the centerline of the lifeline and the attachment point to the body belt or harness).

(B) For deceleration device systems with integral lifelines or lanyards which automatically limit free fall distance to two feet (0.61 m) or less, the test weight should free fall a distance equal to that permitted by the system in normal use. (For example, to test a system with a self-retracting lifeline or lanyard, the test weight should be supported and the system allowed to retract the lifeline or lanyard as it would in normal use. The test weight would then be released and the force and deceleration distance measured).

d. *Failure.* A system fails the force test if the recorded maximum arresting force exceeds 1,260 pounds (15.6 kN) when using a body belt, and/or exceeds 2,520 pounds (11.2 kN) when using a body harness.

e. *Distances.* The maximum elongation and deceleration distance should be recorded during the force test.

5. *Deceleration device tests.* a. *General.* The device should be evaluated or tested under the environmental conditions (such as rain, ice, grease, dirt, type of lifeline, etc.) for which the device is designed.

b. *Rope-grab-type deceleration devices.* (i) Devices should be moved on a lifeline 1,000 times over the same length of line a distance of not less than one foot (30.5 cm), and the mechanism should lock each time.