

but in the opposite direction of the bending in (b) above, at a steady rate in a period of 4 to 8 seconds.

(f) Conduct the burst strength test in S12.6 using 80 percent of the burst strength pressure for the size of tubing being tested as specified in Table VIII.

S12.10 High temperature resistance test. Condition the tubing in an air oven at 230 °F for 72 hours. Remove the tubing and allow to cool at room temperature for 30 minutes. Conduct the burst strength test in S12.6 using 80 percent of the burst strength pressure for the size of tubing being tested as specified in Table VIII.

S12.11 High temperature conditioning, low temperature impact resistance test.

(a) *Apparatus.* Utilize an impact test apparatus as shown in Figure 8.

(b) Condition the tubing in an air oven at 230 °F for 72 hours. Remove the tubing and allow to cool at room temperature for 30 minutes.

(c) Condition the tubing and the impact test apparatus in an environmental chamber at minus 40 °F for 4 hours.

(d) With the tubing and impact test apparatus at minus 40 °F, place the tubing inside the apparatus and drop the impacter onto the tubing from a height of 12 inches. Remove the tubing from the chamber and allow to warm at room temperature for one hour.

(e) Conduct the burst strength test in S12.6 using 80 percent of the burst strength pressure for the size of tubing being tested as specified in Table VIII.

S12.12 Boiling water conditioning, low temperature impact resistance test.

(a) *Apparatus.* Utilize an impact test apparatus as shown in Figure 8.

(b) Condition the tubing in boiling water using the test in S12.4(a) through (d).

(c) Condition the tubing and the impact test apparatus in an environmental chamber at minus 40 °F for 4 hours.

(d) With the tubing and impact test apparatus at minus 40 °F, place the tubing inside the apparatus and drop the impacter onto the tubing from a height of 12 inches. Remove the tubing from the chamber and allow to warm at room temperature for one hour.

(e) Conduct the burst strength test in S12.6 using 80 percent of the burst strength pressure for the size of tubing being tested as specified in Table VIII.

S12.13 Zinc chloride resistance test.

(a) Utilize a cylinder having a radius of two times the nominal outside diameter of the tubing. The cylinder is constructed of a non-reactive material or coated to prevent chemical reaction with zinc chloride.

(b) Bend the tubing 180 degrees around the cylinder and hold in place with a clamp or other suitable support constructed of non-reactive materials, applying only enough force on the tubing to hold it in position.

(c) Immerse the tubing and cylinder in a 50 percent zinc chloride aqueous solution at room temperature for 200 hours.

(d) Remove the tubing and cylinder from the solution. While still on the test cylinder, inspect the tubing under 7-power magnification for cracks.

S12.14 Methyl alcohol resistance.

(a) Utilize a cylinder having a radius of two times the nominal outside diameter of the tubing. The cylinder is constructed of a non-reactive material or coated to prevent chemical reaction with methyl alcohol.

(b) Bend the tubing 180 degrees around the cylinder and hold in place with a clamp or other suitable support

constructed of non-reactive materials, applying only enough force on the tubing to hold it in position.

(c) Immerse the tubing and cylinder in a 95 percent methyl alcohol aqueous solution at room temperature for 200 hours.

(d) Remove the tubing and cylinder from the solution. While still on the test cylinder, inspect the tubing under 7-power magnification for cracks.

S12.15 High temperature conditioning and stiffness.

(a) *Apparatus.* Use a flexibility test device shown in Figure 9 with a spring scale or force transducer to measure the force applied to the tubing during bending.

(b) Prepare an 11-inch long length of tubing. Insert a metal rod 12 inches long of suitable diameter to provide a slip fit inside the tubing, and insert it in the tubing to hold it in a straight position within 1/8 inch of true straightness.

(c) Condition the tubing in an air oven at 230 °F for 24 hours. Remove the tubing and allow to cool at room temperature for two hours.

(d) Remove the metal rod from the tubing and place the tubing in the flexibility test device, with the tubing centered on the device and clearance removed between tubing and the pins and cylinder of the test device. Mark the location of each end of the tubing. Pull on the device until both ends of the tubing have deflected 2 inches from the original position. Record the force applied to the device and verify that it does not exceed the stiffness force in Table VII for the size of tubing being tested.

Figure 9. Stiffness Test Apparatus