

and a .020 inch (5.1 mm) thick wide area washer must be held between two ½-inch (13 mm) nuts that are adjusted to tightly cover the hole in the radiation doors through which the injection rod or calibration calorimeter pass.

(7) *Calorimeter.* A total-flux type calorimeter must be mounted in the center of a ½-inch Kaowool "M" board inserted in the sample holder to measure the total heat flux. The calorimeter must have a view angle of 180 degrees and be calibrated for incident flux. The calorimeter calibration must be acceptable to the Administrator.

(8) *Pilot-Flame Positions.* Pilot ignition of the specimen must be accomplished by simultaneously exposing the specimen to a lower pilot burner and an upper pilot burner, as described in paragraph (b)(8)(i) and (b)(8)(ii) or (b)(8)(iii) of this part IV, respectively. Since intermittent pilot flame extinguishment for more than 3 seconds would invalidate the test results, a spark ignitor may be installed to ensure that the lower pilot burner remains lighted.

(i) *Lower Pilot Burner.* The pilot-flame tubing must be .25 inch (6.3 mm) O.D., .03 inch (0.8 mm) wall, stainless steel tubing. A mixture of 120 cm³/min. of methane and 850 cm³/min. of air must be fed to the lower pilot flame burner. The normal position of the end of the pilot burner tubing is .40 inch (10 mm) from and perpendicular to the exposed vertical surface of the specimen. The centerline at the outlet of the burner tubing must intersect the vertical centerline of the sample at a point .20 inch (5 mm) above the lower exposed edge of the specimen.

(ii) *Standard Three-Hole Upper Pilot Burner.* The pilot burner must be a straight length of .25 inch (6.3 mm) O.D., .03 inch (0.8 mm) wall, stainless steel tubing that is 14 inches (360 mm) long. One end of the tubing must be closed, and three No. 40 drill holes must be drilled into the tubing, 2.38 inch (60 mm) apart, for gas ports, all radiating in the same direction. The first hole must be .19 inch (5 mm) from the closed end of the tubing. The tube must be positioned .75 inch (19 mm) above and .75 inch (19 mm) behind the exposed upper edge of the specimen. The middle hole must be in the vertical plane perpendicular to the exposed surface of the specimen which passes through its vertical centerline and must be pointed toward the radiation source. The gas supplied to the burner must be methane and must be adjusted to produce flame lengths of 1 inch (25 mm).

(iii) *Optional Fourteen-Hole Upper Pilot Burner.* This burner may be used in lieu of the standard three-hole burner described in paragraph (b)(8)(ii) of this part IV. The pilot burner must be a straight length of .25 inch (6.3 mm) O.D., .03 inch (0.8 mm) wall, stainless steel tubing that is 15.75 inches (400 mm) long. One end of the tubing must be closed, and 14 No. 59 drill holes must be drilled into

the tubing, .50 inch (13 mm) apart, for gas ports, all radiating in the same direction. The first hole must be .50 inch (13 mm) from the closed end of the tubing. The tube must be positioned above the specimen holder so that the holes are placed above the specimen as shown in Figure 1B of this part IV. The fuel supplied to the burner must be methane mixed with air in a ratio of approximately 50/50 by volume. The total gas flow must be adjusted to produce flame lengths of 1 inch (25 mm). When the gas/air ratio and the flow rate are properly adjusted, approximately .25 inch (6 mm) of the flame length appears yellow in color.

(c) *Calibration of Equipment*—(1) *Heat Release Rate.* A calibration burner, as shown in Figure 4, must be placed over the end of the lower pilot flame tubing using a gas tight connection. The flow of gas to the pilot flame must be at least 99 percent methane and must be accurately metered. Prior to usage, the wet test meter must be properly leveled and filled with distilled water to the tip of the internal pointer while no gas is flowing. Ambient temperature and pressure of the water are based on the internal wet test meter temperature. A baseline flow rate of approximately 1 liter/min. must be set and increased to higher preset flows of 4, 6, 8, 6 and 4 liters/min. Immediately prior to recording methane flow rates, a flow rate of 8 liters/min. must be used for 2 minutes to precondition the chamber. This is not recorded as part of calibration. The rate must be determined by using a stopwatch to time a complete revolution of the wet test meter for both the baseline and higher flow, with the flow returned to baseline before changing to the next higher flow. The thermopile baseline voltage must be measured. The gas flow to the burner must be increased to the higher preset flow and allowed to burn for 2.0 minutes, and the thermopile voltage must be measured. The sequence must be repeated until all five values have been determined. The average of the five values must be used as the calibration factor. The procedure must be repeated if the percent relative standard deviation is greater than 5 percent. Calculations are shown in paragraph (f) of this part IV.

(2) *Flux Uniformity.* Uniformity of flux over the specimen must be checked periodically and after each heating element change to determine if it is within acceptable limits of plus or minus 5 percent.

(3) As noted in paragraph (b)(2) of this part IV, thermopile hot junctions must be cleared of soot deposits as needed to maintain the calibrated sensitivity.

(d) *Preparation of Test Specimens.* (1) The test specimens must be representative of the aircraft component in regard to materials and construction methods. The standard size for the test specimens is 5.91 ± .03 × 5.91 ± .03 inches (149 ± 1 × 149 ± 1 mm). The thickness of