MASTER

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Subject: EML-M1-01 Shield Element
Thermal Shock Test
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A shield element specimen was tested to determine possible striae cracking of the shield that would occur during reactor startup or other severe thermal shock conditions. The specimen was reactor grade material, and was 15/16 inches in diameter and 11-1/2 inches long.

The test was performed by mounting the specimen in a holder that directed a flow of high pressure cryogenic gaseous helium at 150°R temperature into a small annulus formed by the outside surface of the specimen and inside surface of the holder. The annulus flow passage was representative in size to that anticipated in the reactor design.

Instantaneous chilling of the specimen was obtained by use of a gas diverting system. Two fast response synchronized valves were connected to the main gas source in a manner that the gas flow could be diverted through one or the other. The holder with the specimen was connected to the outlet of one of the valves. To the outlet of the other valve a calibrated flow resistance equal to the flow resistance of the holder with the specimen was connected.

The required gas flow rate was determined by an orifice flow meter while the cold gas was flowing through the calibrated flow resistance. Then the flow was diverted through the holder with the specimen by simultaneous closing the valve connected to the calibrated flow resistance and opening the valve connected to the holder with the specimen.

INFORMATION CATEGORY

Unclassified
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Two tests were performed at helium gas flow rates of approximately 0.2 lbs/sec and 5 lbs/sec.

Visual inspection after each test revealed that the thermal shock did not damage the specimen.

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