Checking Clearance When a Ring Warms

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A display mounts a solid cylinder through a ring without gluing them together. The diameter clearance equals the inside diameter of the ring minus the outside diameter of the cylinder. The parts warm freely. The model gives each part’s diameter change for the stated temperature rise.

Part	**Diameter at start (mm)**	**Diameter change when warmed (mm)**
Ring opening	10.00	+0.06
Cylinder	9.98	+0.09

1 What is the starting diameter clearance?

(1) 0.02 mm

(2) 0.06 mm

(3) 0.09 mm

(4) 0.15 mm

2 Use the free-expansion readings to predict whether the warm cylinder fits through the warm ring. [1]

Answer and work

3 A student says the opening must shrink when a solid ring expands. Use the model readings to evaluate the claim. [1]

Answer and work

A replacement cylinder has the same starting diameter. The mount needs at least 0.01 mm of clearance after warming.

4 Find the greatest diameter increase a replacement cylinder can have and still meet the warm clearance requirement. [1]

Answer and work