Appendix C – Calculation of Valve Constraints on Minimum Motor RPM

Consider the ball over the travel distance of 2mm from rest to the mouth of the valve where the ball seals it. The law of conservation of energy is required to determine the final velocity of the ball when the ball seals the valve, i.e. and excluding the rotation of the ball:

Assuming the minimum radius of rotation of the motor arm to be 1cm: