

ACFD 2017, Project 2, Instructor's remarks

Task 1

With "B" open, the mass flow rates (MFRs) associated to the side pipes should decrease from pipe 1 to pipe 5. With "B" closed, the trend is reversed. See the three reference solutions for detail. For this project, values of MFR for either "half pipe" or "full pipe" are acceptable, as long as consistency is maintained through the report.

Task 2

With the given constraints, a state of uniform MFRs across the 5 side pipes is generally achievable. This can be done by adjusting the opening at "B", adjusting the diameters of the side pipes, or both. See examples in the reference solutions.

An interesting solution, given in reference solution #3, is to close "B" while significantly decreasing the diameter of the side pipes. At this limit, we do expect the MFRs to become uniform. (In practice, the price we pay is that we need to maintain a very high pressure in the "pressure vessel".)