

### S.1. Grid dependence test

The size of the mesh was determined from a grid dependence test. Temperature and velocity were tested using a steady-state simulation on the studied geometry. This consisted in an air feed (20°C) from the inlet with heat transfer from the walls at a constant temperature (300°C). Smaller values for maximum face size (in meters) provided a higher accuracy for results, as depicted in figure A and B. Temperature exhibited a strong relationship with the mesh size, while flow velocity showed a negligible effect. The best performing result proved to be 0.0025 m.

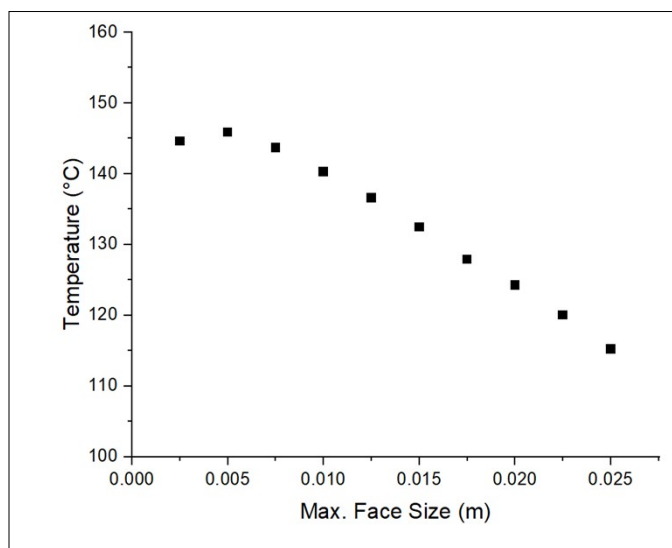


Figure A. Effect of mesh size on temperature.

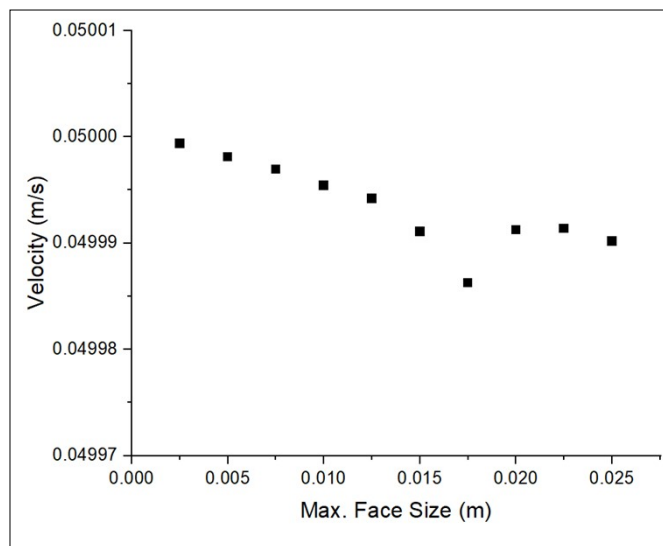


Figure B. Effect of mesh size on flow velocity.

## S.2. Simulation convergence

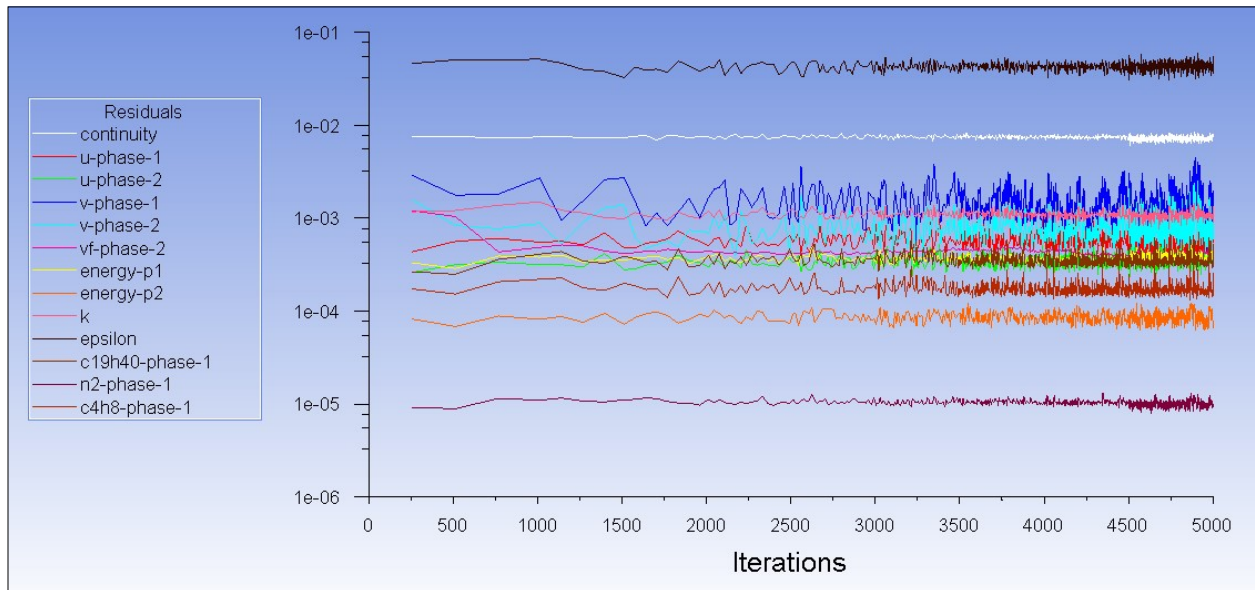


Figure C. Convergence of residuals for the 500°C and 1 kg/m<sup>2</sup>.s case.