[ABSTRACT]

There is provided a technique capable of shortening a temperature stabilization time in a process chamber by improving a heat insulation performance of a lower portion of the process chamber. A heat insulation structure is arranged in a vicinity of a furnace opening of a heat treatment furnace wherein a temperature gradient is formed at the vicinity of the furnace opening. The heat insulation structure includes a plurality of heat insulation plates with predetermined gaps therebetween. Each heat insulation plate includes a heat shield made of metal; and a seal made of quartz or ceramics and configured to cover a front surface and a rear surface of the heat shield. The heat shield is arranged in a vacuum cavity provided in the seal.