CLAIMS:

1. A thermal processing system, comprising:

a processing chamber;

a workpiece support configured to support a workpiece within the processing chamber;

a heat source configured to emit light towards the workpiece;

a shutter disposed between the workpiece and the heat source, the shutter comprising an electrochromic material configurable in a translucent state and an opaque state, wherein when the electrochromic material is configured in the opaque state, the shutter reduces transmission of light through the shutter, and when the electrochromic material is configured in the translucent state, light at least partially passes through the shutter; and

a controller configured to control the shutter to reduce transmission of light through the shutter during a thermal treatment process;

wherein the thermal treatment process is a spike anneal process, the spike anneal process increasing a temperature of the workpiece by greater than 500 °C or in less than 2 seconds, the spike anneal process associated with an increase in temperature to a peak temperature and a decrease in temperature from the peak temperature; and

wherein the controller is configured to control an operational state of the shutter during the spike anneal process to reduce a peak width associated with the spike anneal process, wherein the controller is configured to control the operational state of the shutter such that the spike anneal process has a 50K temperature peak width of 0.8 second or less.

2. The thermal processing system of claim 1, wherein when the shutter is in the opaque state, the shutter is configured to be reflective.

3. The thermal processing system of claim 1, wherein the controller is configured to control an operational state of the shutter based at least in part on a heat source activation signal to reduce the transmission of the light through the shutter during the thermal treatment process.

4. The thermal processing system of claim 3, wherein the heat source activation signal specifies activation of the heat source to emit the light during the thermal treatment process.

5. The thermal processing system of claim 3, wherein the controller is configured to change the operational state of the shutter from the translucent state to the opaque state after expiration of a time interval from activation of the heat source during the thermal treatment process.

6. The thermal processing system of claim 5, wherein the time interval is in a range of 5 milliseconds to 100 milliseconds.

7. The thermal processing system of claim 1, wherein the controller is configured to control an operational state of the shutter based at least in part on a temperature setpoint to reduce the transmission of the light through the shutter during the thermal treatment process.

8. The thermal processing system of claim 7, wherein the controller is configured to change the operational state of the shutter from the translucent state to the opaque state based at least in part on a temperature of the workpiece reaching the temperature setpoint.

9. The thermal processing system of claim 8, wherein data indicative of the temperature of the workpiece is obtained via one or more pyrometers.

10. The thermal processing system of claim 7, wherein the temperature setpoint is within 20% of a peak temperature of a heating profile associated with the thermal treatment process.

11. The thermal processing system of claim 1, wherein the heat source is a lamp heat source.

12. A method for controlling operation of a thermal processing system comprising a heat source and a shutter positioned between the heat source and a workpiece disposed within a processing chamber of the thermal processing system, the method comprising:

activating the heat source to emit light to heat the workpiece for a spike anneal process, the spike anneal process increasing a temperature of the workpiece by greater than 500 °C or in

less than 2 seconds, the spike anneal process associated with an increase in temperature to a peak temperature and a decrease in temperature from the peak temperature;

determining expiration of a time interval subsequent to activating the heat source during the spike anneal process; and

upon the expiration of the time interval, controlling the shutter to change an operational state of the shutter from a translucent state to an opaque state to reduce transmission of light from the heat source through the shutter during the spike anneal process;

wherein the shutter comprises an electrochromic material configurable in the translucent state or the opaque state, wherein when the electrochromic material is configured in the opaque state, the shutter reduces transmission of light through the shutter, and when the electrochromic material is configured in the translucent state, light at least partially passes through the shutter; and

wherein controlling the shutter to change the operational state of the shutter comprises controlling the shutter to change the operational state of the shutter to reduce a peak width associated with the spike anneal process, wherein the controller is configured to control the operational state of the shutter such that the spike anneal process has a 50K temperature peak width of 0.8 second or less.

13. The method of claim 12, wherein when the shutter is in the opaque state, the shutter is configured to be reflective.

14. The method of claim 12, wherein the time interval is in a range of 5 milliseconds to 100 milliseconds.

15. A method for controlling operation of a thermal processing system comprising a heat source and a shutter positioned between the heat source and a workpiece disposed within a processing chamber of the thermal processing system, the method comprising:

obtaining data indicative of a temperature of the workpiece during a spike anneal process, the spike anneal process increasing a temperature of the workpiece by greater than 500 °C or in less than 2 seconds, the spike anneal process associated with an increase in temperature to a peak temperature and a decrease in temperature from the peak temperature;

accessing data indicative of a temperature setpoint; and

controlling the shutter to change an operational state of the shutter from a translucent state to an opaque state based at least in part on the temperature of the workpiece reaching the temperature setpoint during the spike anneal process;

wherein the shutter comprises an electrochromic material configurable in the translucent state or the opaque state, wherein when the electrochromic material is configured in the opaque state, the shutter reduces transmission of light emitted from the heat source through the shutter, and when the electrochromic material is configured in the translucent state, light at least partially passes through the shutter; and

wherein controlling the shutter to change the operational state of the shutter comprises controlling the shutter to change the operational state of the shutter to reduce a peak width associated with the spike anneal process, wherein the controller is configured to control the operational state of the shutter such that the spike anneal process has a 50K temperature peak width of 0.8 second or less.

16. The method of claim 15, wherein the temperature setpoint is within 20% of a peak temperature of a heating profile associated with the spike anneal process.