CLAIMS

1. A physical vapor deposition target assembly comprising:

a source material;

a cover plate;

a backing plate having a front side and a back side, the backing plate configured to support the source material on a front side of the backing plate; and

a cooling tube including an inlet end configured to be connected to cooling fluid, a first outlet end fluidly coupled to the inlet end, an inlet row and a plurality of bends between the inlet end and the outlet end, the inlet row dividing a first pair of rows on a first side of the inlet row and a second pair of rows on a second side of the inlet row, the cooling tube disposed between the backing plate and the cover plate, the cooling tube configured to be placed adjacent the back side of the backing plate to cool the backing plate and the source material during a physical vapor deposition process.

2. The physical vapor deposition target assembly of claim 1, wherein the cooling tube is separate from the backing plate and the cooling tube provides a closed cooling loop containing the cooling fluid.

3. The physical vapor deposition target assembly of claim 1, the backing plate further comprising a channel in the back side configured to receive the cooling tube.

4. The physical vapor deposition target assembly of claim 3, the flow pattern comprising at least six rows and five bends.

5. The physical vapor deposition target assembly of claim 3, the flow pattern comprising at least eight rows and six bends.

6. The physical vapor deposition target assembly of claim 2, the inlet end fluidly connected to a single row fluidly connected to the first pair of rows and the second pair of rows by a split connection, and the first outlet end fluidly connected to the first pair of rows and second pair of rows.

7. The physical vapor deposition target assembly of claim 3, the inlet end fluidly connected to a single row fluidly connected to the first pair of rows and the second pair of rows by a split connection, and the first outlet end fluidly connected to the first pair of rows and the second pair of rows.

8. The physical vapor deposition target assembly of claim 7, the cooling tube comprising a single inlet end and a single outlet end.

9. The physical vapor deposition target assembly of claim 7, the cooling tube comprising a single inlet end and the first outlet end and a second outlet end, the first outlet end fluidly connected to the first pair of rows and the second outlet end fluidly connected to the second pair of rows.

10. The physical vapor deposition target assembly of claim 7, the cooling tube comprising multiple inlet ends and multiple outlet ends.

11. A physical vapor deposition target assembly comprising:

a source material;

a backing plate having a front side and a back side, the backing plate configured to support the source material on a front side of the backing plate;

a cover plate coupled to the backing plate; and channels disposed between the cover plate and the backing plate, the channels including a plurality of bends defining a flow pattern including at least four rows and at least three bends, the at least four rows and three bends fluidly connected to an inlet end and a first outlet end, an inlet row dividing the at least four rows into a first pair of rows on a first side of the inlet row and a second pair of rows on a second side of the inlet row, the channels configured to flow cooling fluid adjacent the back side of the backing plate to cool the backing plate and the target during a physical vapor deposition process.

12. The physical vapor deposition target assembly of claim 11, the flow pattern including at least five rows including the inlet row fluidly connected to the inlet end, the inlet row fluidly connected to the first pair of rows and the second pair of rows by a split connection.

13. The physical vapor deposition target assembly of claim 12, the flow pattern comprising at least six rows and five bends.

14. The physical vapor deposition target assembly of claim 12, the flow pattern comprising at least eight rows and six bends.

15. The physical vapor deposition target assembly of claim 11, the flow pattern comprising the first pair of rows and the second pair of rows, the inlet end fluidly connected to a single row fluidly connected to the first pair of rows and second pair of rows by a split connection, and the first outlet end fluidly connected to the first pair of rows and second pair of rows.

16. The physical vapor deposition target assembly of claim 15, the channels fluidly connected to a single inlet end and a single outlet end.

17. The physical vapor deposition target assembly of claim 15, the channels fluidly connected to a single inlet end and the first outlet end and a second outlet end, the first outlet end fluidly connected to the first pair of rows and the second outlet end fluidly connected to the second pair of rows.

18. The physical vapor deposition target assembly of claim 11, further comprising tubing disposed within said channels and fluidly connected to the inlet end and the first outlet end.

19. A method of cooling a physical vapor deposition target, the method comprising continuously flowing cooling fluid through the channels of claim 11 during a physical vapor deposition process.