CLAIMS

We claim:

1. A cooling hole location system (100) for locating a cooling hole (150) in a gas turbine component (110), wherein the cooling hole (150) is covered by a thermal barrier coating (140), comprising:

a light source (160) positioned on a first side (162) of the gas turbine component (110); and

an optical detector (170) positioned on a second side (164) of the gas turbine component (110);

wherein the light source (160) and/or the optical detector (170) is maneuverable with respect to the gas turbine component (110); and

wherein the optical detector (170) detects light from the light source (160) visible through the thermal barrier coating (140) covering the cooling hole (150) so as to determine location and orientation of the cooling hole.

2. The cooling hole location system (100) of claim 1, further comprising a controller (180) in communication with the light source (160) and the optical detector (170).

3. The cooling hole location system (100) of claim 2, further comprising a display (190) in communication with the controller (180).

4. The cooling hole location system (100) of claim 1, further comprising a machining system (200) to remove the thermal barrier coating (140) covering the cooling hole (150).

5. The cooling hole location system (100) of claim 1, wherein the gas turbine component (110) comprises a combustion component (120).

6. The cooling hole location system (100) of claim 1, wherein the gas turbine component (110) comprises a hot gas path component (130).

7. The cooling hole location system (100) of claim 6, wherein the hot gas path (110) component comprises an airfoil (70).

8. The cooling hole location system (100) of claim 1, wherein the first side (162) comprising an interior of the gas turbine component (110).

9. The cooling hole location system (100) of claim 1, wherein the first side (162) comprises an exterior of the gas turbine component (110).

10. The cooling hole location system (100) of claim 1, wherein the light source (160) is maneuverable about an axis of the cooling hole (150).

11. The cooling hole location system (100) of claim 1, wherein the light source (160) comprises a visible light source.

12. The cooling hole location system (100) of claim 1, wherein the light source (160) comprises an infrared light source.

13. A method of locating a cooling hole (150) in a gas turbine component (110) covered with a thermal barrier coating (140), comprising:

positioning a light source (160) on a first side (162) of the gas turbine component (110);

positioning an optical detector (170) on a second side (164) of the gas turbine component (110);

transmitting light from the light source (160) at the first side (162) of the gas turbine component 9110); and

maneuvering the light source (160) and/or the optical detector (170) until the light is detected through the thermal barrier coating (140) by the optical detector (170) so as to determine location and orientation of the cooling hole (150).

14. A cooling hole location system (100) for locating a gas turbine component cooling hole covered by a thermal barrier coating (140), comprising:

a gas turbine component (110);

a light source (160) positioned on a first side (162) of the gas turbine component (110);

an optical detector (170) positioned on a second side (164) of the gas turbine component (110); and

a machining system (200);

wherein the light source (160) and/or the optical detector (170) is maneuverable with respect to the gas turbine component (110);

wherein the optical detector (170) detects light from the light source (160) visible through the thermal barrier coating (140) covering the cooling hole (150) so as to determine location and orientation of the cooling hole (150); and

wherein the machining system (200) removes the thermal barrier coating covering the cooling hole (150).

15. The cooling hole location system (100) of claim 14, further comprising a controller in communication with the light source (160), the optical detector (170), and the machining system (200).

16. The cooling hole location system (100) of claim 14, wherein the gas turbine component (110) comprises a combustion component (120) or a hot gas path component (130).

17. The cooling hole location system (100) of claim 14, wherein the first side (162) comprising an interior or an exterior of the gas turbine component (110).