WHAT IS CLAIMED IS:

1. An imaging system comprising:

a sight tube extending along a longitudinal axis of said imaging system and configured to extend through an access port, said sight tube including a wall extending about the longitudinal axis and defining a cavity, wherein said wall is constructed of at least one metal; and

a plurality of cooling channels defined by said wall and extending through said sight tube, wherein said plurality of cooling channels are configured to direct cooling fluid through said sight tube for cooling said imaging system, and wherein said plurality of cooling channels are formed in said sight tube such that at least one cooling channel of said plurality of cooling channels extends in a direction oblique to the longitudinal axis.

2. The imaging system in accordance with claim 1, wherein said plurality of cooling channels are connected in flow communication by at least one of an angled portion and a curved portion defined by said wall to form a closed-loop cooling system.

3. The imaging system in accordance with claim 1 further comprising at least one support structure extending from said wall into the cavity to support at least one optical element positioned in the cavity, wherein said at least one support structure includes a flexible material configured to reduce vibration of the at least one optical element.

4. The imaging system in accordance with claim 1 further comprising a plurality of support structures extending from said wall into the cavity to support at least one optical element positioned in the cavity, wherein said plurality of support structures define said at least one cooling channel.

5. The imaging system in accordance with claim 4 further comprising an optical tube, wherein each support structure of said plurality of support structures defines a porous surface configured to contact said optical tube.

6. The imaging system in accordance with claim 4 further comprising an optical tube, wherein each support structure of said plurality of support structures includes an edge configured to contact said optical tube, and wherein a majority of said optical tube is free from contact with said plurality of support structures.

7. The imaging system in accordance with claim 1, wherein said plurality of cooling channels comprises a first set of open-loop cooling channels and a second set of closed-loop cooling channels.

8. The imaging system in accordance with claim 1, wherein each cooling channel of said plurality of cooling channels contains an insulating material.

9. The imaging system in accordance with claim 1, wherein said plurality of cooling channels have a helical shape.

10. The imaging system in accordance with claim 1 further comprising at least one support structure within the cavity, wherein said at least one support structure includes a lattice.

11. The imaging system in accordance with claim 1 further comprising a flange configured to mount on a portion of a turbomachine, said flange coupled to said sight tube such that said sight tube extends through said flange and into the turbomachine when said flange is coupled to the turbomachine.

12. The imaging system in accordance with claim 11, wherein said flange includes a biasing member configured to contact said sight tube.

13. The imaging system in accordance with claim 11 further comprising a camera coupled to said flange and configured to generate images of the turbomachine.

14. The imaging system in accordance with claim 1, wherein said at least one cooling channel is formed in said sight tube using an additive manufacturing process such that said at least one cooling channel includes at least one of an angled portion and a curved portion along the extension through the sight tube.

15. The imaging system in accordance with claim 1 further comprising at least one support structure extending from said wall into the cavity to support at least one optical element positioned in the cavity, wherein said at least one support structure is aligned with at least one cooling channel of said plurality of cooling channels.

16. An imaging system for inspection of a turbomachine, said imaging system comprising:

a sight tube extending along a longitudinal axis of said imaging system and configured to extend through an access port of the turbomachine, said sight tube including a wall extending about the longitudinal axis and defining a cavity therein;

an optical tube including a wall configured to fit within the cavity of said sight tube, said optical tube positioned in the cavity such that said optical tube extends along the longitudinal axis, wherein said optical tube is modular and is releasably coupled to said sight tube, said optical tube including a plurality of optical elements positioned along the longitudinal axis,

wherein said plurality of optical elements includes at least one lens positioned within said optical tube; and

at least one cooling channel extending through said sight tube, wherein said at least one cooling channel is configured to extend alongside said at least one lens positioned within said optical tube when said optical tube is coupled to said sight tube.

17. The imaging system in accordance with claim 16 further comprising a plurality of support structures extending from said wall to support said optical tube, wherein said plurality of support structures define at least one cooling channel.

18. The imaging system in accordance with claim 17, wherein each support structure of said plurality of support structures defines a porous surface configured to contact said optical tube.

19. The imaging system in accordance with claim 17, wherein each support structure of said plurality of support structures includes an edge configured to contact said optical tube containing such that a majority of said optical tube is free from contact with said plurality of support structures.

20. The imaging system in accordance with claim 16, wherein said at least one cooling channel is formed in said sight tube using an additive manufacturing process such that said at least one cooling channel extends in a direction oblique to the longitudinal axis.