CLAIMS

1. An additive layer manufactured hot work tool comprises a component composition of, by mass%, C: 0.3 to 0.5%, Si: 2.0% or less, Mn: 1.5% or less, P: 0.05% or less, S: 0.05% or less, Cr: 3.0 to 5.0%, 1 or 2 kinds of compounds of Mo and W, a relation between Mo and W being represented by a relational expression (Mo+1/2W): 0.5 to 3.5%, V: 0.1 to 1.5%, Ni: 0 to 1.0%, Co: 0 to 1.0%, Nb: 0 to 0.3%, and Fe and an unavoidable impurity as a remainder, wherein

defects having an area of less than 1 μm^2 and defects having an area of 1 μm^2 or more are included in a cross section parallel to the lamination direction, and

an area ratio of the defects having an area of 1 μm^2 or more is 0.6% or less.

2. The additive layer manufactured hot work tool according to Claim 1, wherein

hardness is 40 to 50 HRC.

3. A method of manufacturing an additive layer manufactured hot work tool comprising:

an additive layer manufacturing step of forming an additive layer manufactured object by repeating an operation of laying out, on a stage, a metal powder comprising a component composition of, by mass%, C: 0.3 to 0.5%, Si: 2.0% or less, Mn: 1.5% or less, P: 0.05% or less, S: 0.05% or less, Cr: 3.0 to 5.0%, 1 or 2 kinds of compounds of Mo and W, a relation between Mo and W being represented by a relational expression (Mo+1/2W): 0.5 to 3.5%, V: 0.1 to 1.5%, Ni: 0 to 1.0%, Co: 0 to 1.0%, Nb: 0 to 0.3%, and Fe and an unavoidable impurity as a remainder, irradiating the metal powder laid out on the stage with a heat source while scanning the heat source on the metal powder in a condition that an energy density of the heat source which is expressed by a following formula is 50 to 150 J/mm^3, and partially melting and solidifying the metal powder upward in a scanning

direction of the heat source; and

a heat treatment step of tempering the additive layer manufactured object formed in the additive layer manufacturing step at a tempering temperature of 500 to 700 ℃.

Energy density of heat source (J/mm^3)

= output of heat source (W)/[scanning rate of heat source (mm/sec) × scanning pitch of heat source (mm) × lamination thickness per scanning (mm)]

4. The method according to Claim 3, wherein

in the heat treatment step, quenching is performed at a quenching temperature of 900 to 1100 ℃ before the tempering is performed.

5. The method according to Claim 4, wherein

in the heat treatment step, the quenching temperature is set to 1010 ℃ or less.

6. The method according to Claim 3, wherein

in the heat treatment step, the quenching is not performed before the tempering is performed.

7. The method according to any one of Claims 3 to 6, wherein

in the heat treatment step, hardness is adjusted to 40 to 50 HRC.

8. A metal powder for an additive layer manufactured hot work tool comprising a component composition of, by mass%, C: 0.3 to 0.5%, Si: 2.0% or less, Mn: 1.5% or less, P: 0.05% or less, S: 0.05% or less, Cr: 3.0 to 5.0%, 1 or 2 kinds of compounds of Mo and W, a relation between Mo and W being represented by a relational expression (Mo+1/2W): 0.5 to 3.5%, V: 0.1 to 1.5%, Ni: 0 to 1.0%, Co: 0 to 1.0%, Nb: 0 to 0.3%, and Fe and an unavoidable impurity as a remainder, wherein a median diameter D50 of the metal powder is 10 to 200 μm when measured by a laser diffraction/scattering method.

9. The additive layer manufactured hot work tool according to Claim 1, wherein the Cr is 4.3 mass% or less.

10. The method according to Claim 3, wherein the heat source is scanned at a scanning rate of 400 to 1800 mm/second.

11. The method according to Claim 3, wherein the Cr is 4.3 mass% or less.

12. The metal powder for an additive layer manufactured hot work tool according to Claim 8, wherein the Cr is 4.3 mass% or less.