CLAIMS

What is claimed is:

1. A porous sintered body, comprising:

an isotropic composition of metal powder particles and metal fibers sintered together having a porous structure, wherein the metal powder particles are nodes sintered to portions of one or more metal fibers in said porous sintered body, and the metal fibers are sintered to portions of one or more other metal fibers throughout the porous sintered body, and further wherein the composition comprises pores of 10 or fewer microns in size.

2. The porous sintered body of Claim 1, wherein a first surface of the porous sintered body has a distribution of metal powder particles and metal fibers that is about the same as a distribution of metal powder particles and metal fibers of a second surface of the porous sintered body.

3. The porous sintered body of any of claims 1 or 2 where the air permeability of the porous sintered body is greater than 1.7 standard liters per minute of air per square centimeter of geometric area of porous sintered body at a pressure differential of 14 pounds per square inch and an LRV of the porous sintered body is greater than 6 LRV as determined when several million particles with a size distribution centered around 0.014 microns as an aerosol is used to challenge the porous sintered body.

4. The porous sintered body of claim 3 that has a thickness of 0.28 centimeters and an LRV of greater than 6 as determined when several million particles with a size distribution centered around 0.014 microns as an aerosol is used to challenge the porous sintered body.

5. A diffuser comprising the porous sintered body of claim 4.

6. A filter comprising the porous sintered body of claim 4.

7. A porous sintered body, made by the steps comprising:

(a) blending metal powder particles and metal fibers together to dissipate electrostatic charge and achieve a uniform mixture of metal powder particles and metal fiber; and

(b) sintering the uniform mixture together to form a porous sintered body, comprising an isotropic composition of metal powder particles and metal fibers sintered together having a porous structure, wherein the metal powder particles are nodes sintered to portions of one or more metal fibers in said porous sintered body, and the metal fibers are sintered to portions of one or more other metal fibers throughout the porous sintered body, and further wherein the composition comprises pores of 10 or fewer microns in size.

8. The porous sintered body of any one of Claims 1-3 or 7, wherein the metal fibers have a diameter of about 1 to about 20 microns.

9. The porous sintered body of Claim 8, wherein the metal fibers have a diameter of about 1 to about 2 microns.

10. The porous sintered body of any one of Claims 1-3 or 7, wherein the metal fibers have an aspect ratio of about 25 to about 125.

11. The porous sintered body of any one of Claims 1-3 or 7, wherein the metal powder particles have a dimension no larger than about 10 to about 100 microns.

12. The porous sintered body of any one of Claims 1-3 or 7, wherein the body has a porosity of at least 55%.

13. The porous sintered body of any one of Claims 1-3 or 7, wherein the body has a porosity of at least 58%.

14. The porous sintered body of any one of Claims 1-3 or 7, wherein the metal powder particles and metal fibers are each independently nickel or stainless steel.

CLAIMS

What is claimed is:

1. A porous sintered body, comprising:

an isotropic composition of metal powder particles and metal fibers sintered together having a porous structure, wherein the metal powder particles are nodes sintered to portions of one or more metal fibers in said porous sintered body, and the metal fibers are sintered to portions of one or more other metal fibers throughout the porous sintered body, wherein the porous sintered body comprises a) pores of 10 or fewer microns in size, b) an air permeability greater than 1.7 standard liters per minute of air per square centimeter of the porous sintered body when measured at a pressure differential of 14 pounds per square inch, and c) an LRV greater than 6 when a 0.28 centimeter thick porous sintered body is challenged with an aerosol distribution of particles having a size distribution centered around 0.014 microns at approximately 2 standard liters per minute per square centimeter of the porous sintered body.

2. The porous sintered body of Claim 1, wherein a first surface of the porous sintered body has a distribution of metal powder particles and metal fibers that is about the same as a distribution of metal powder particles and metal fibers of a second surface of the porous sintered body.

3. A diffuser comprising the porous sintered body of claim 1.

4. A filter comprising the porous sintered body of claim 1.

5. A porous sintered body, made by the steps comprising:

(a) blending metal powder particles and metal fibers together to dissipate electrostatic charge and achieve a uniform mixture of metal powder particles and metal fiber; and

(b) sintering the uniform mixture together to form a porous sintered body, comprising an isotropic composition of metal powder particles and metal fibers sintered together having a porous structure, wherein the metal powder particles are nodes sintered to portions of one or more metal fibers in said porous sintered body, and the metal fibers are sintered to portions of one or more other metal fibers throughout the porous sintered body, wherein the composition comprises a) pores of 10 or fewer microns in size, b) an

air permeability greater than 1.7 standard liters per minute of air per square centimeter of the porous sintered body when measured at a pressure differential of 14 pounds per square inch, and c) an LRV greater than 6 when a 0.28 centimeter thick porous sintered body is challenged with an aerosol distribution of particles having a size distribution centered around 0.014 microns at approximately 2 standard liters per minute per square centimeter of the porous sintered body.

6. The porous sintered body of any one of Claims 1, 2, or 5, wherein the metal fibers have a diameter of 1 to 20 microns.

7. The porous sintered body of Claim 6, wherein the metal fibers have a diameter of 1 to 2 microns.

8. The porous sintered body of any one of Claims 1, 2, or 5, wherein the metal fibers have an aspect ratio of 25 to 125.

9. The porous sintered body of any one of Claims 1, 2, or 5, wherein the metal powder particles have a dimension no larger than 10 to 100 microns.

10. The porous sintered body of any one of Claims 1, 2, or 5, wherein the body has a porosity of at least 55%.

11. The porous sintered body of any one of 1, 2, or 5, wherein the body has a porosity of at least 58%.

12. The porous sintered body of any one of Claims 1, 2, or 5, wherein the metal powder particles are nickel or stainless steel and the metal fibers are nickel or stainless steel.