CLAIMS:

1. Neutron shielding comprising:

a plurality of absorption layers, each comprising a tungsten boride or a tungsten carbide; and

at least one moderating layer comprising a metal hydride;

wherein each moderating layer is between at least two absorption layers;

configured such that in use the outermost absorption layer is between the adjacent moderating layer and the neutron source.

2. Neutron shielding according to claim 1, wherein the metal hydride comprises one or more of the metals from groups 4, 5 and 6 from the periodic table and/or yttrium, beryllium, gadolinium, or uranium.

3. Neutron shielding according to claim 2, wherein the metal hydride comprises one or more of hafnium, niobium, tantalum, titanium, yttrium, and zirconium.

4. Neutron shielding according to any preceding claim, wherein the metal hydride comprises at least 5 metals, each metal having an atomic proportion of 5 mol.% to 50 mol. % compared to the total number of metal atoms in the metal hydride.

5. Neutron shielding according to any preceding claim, wherein the metal hydride has a ratio of hydrogen atoms to metal atoms between 0.1 and 4, more preferably between 1 and 2.

6. Neutron shielding according to any preceding claim, wherein each absorption layer comprises an alloy of tungsten metal and tungsten boride and/or carbide.

7. Neutron shielding according to any preceding claim, wherein the total thickness of the absorption layers is at least 75% of the total combined thickness of the absorption layers and the moderating layers, more preferably between 80% and 95%.

8. Neutron shielding according to any preceding claim, wherein the outermost absorption layer has a thickness which is between 30% and 90% of the total combined

thickness of the absorption layers and the moderating layers, more preferably between 40% and 80%.

9. Neutron shielding according to claim 8, wherein a further absorption layer which is not the outermost absorption layer has a thickness which is at least 10% of the total combined thickness of the absorption layers and the moderating layers.

10. Neutron shielding according to any preceding claim, and comprising coolant channels located between the absorption layers and the moderating layers.

11. Neutron shielding according to any preceding claim, and comprising coolant channels integrated within one or more of the absorption layers and/or the moderating layers.

12. An assembly comprising neutron shielding according to claim 10 or 11, and a coolant source connected to the coolant channels, wherein the coolant source is configured to maintain the neutron shielding at a temperature below a decomposition temperature of the metal hydride.

13. A tokamak nuclear fusion reactor comprising:

a toroidal plasma chamber;

a plasma confinement system arranged to generate a magnetic field for confining a plasma in an interior of the plasma chamber;

neutron shielding according to any of claims 1 to 11 arranged between the interior of the toroidal plasma chamber and the plasma confinement system, such that the outermost layer faces the interior of the toroidal plasma chamber.

14. A tokamak nuclear fusion reactor according to claim 13, wherein the neutron shielding is neutron shielding according to claim 10 or 11, and comprising a coolant source connected to the coolant channels, wherein the coolant source is configured to maintain the neutron shielding at a temperature below a decomposition temperature of the metal hydride.