wall of the channel body, a center line of each annular plate is consistent with a center line of the channel body, and the annular plates are arranged at intervals along a length direction of the channel body.

**[0014]** Preferably, the annular plate is in a shape of a side surface of truncated cone, and a distance between an inner ring side of the annular plate and the A inlet is smaller than a distance between an outer ring side thereof and the A inlet.

**[0015]** Preferably, flanges are arranged at two ends of the channel body, respectively.

**[0016]** Preferably, a magnetic field device is arranged beside the channel body, and an intensity of a magnetic field applied by the magnetic field device is 0.01 T-0.98 T.

**[0017]** Preferably, the adsorption unit is detachably connected to the channel body.

**[0018]** Preferably, the channel body is made of stainless steel, oxygen-free copper, copper alloy, or aluminum alloy.

**[0019]** Preferably, a cross section of the spiral tube is circular, rectangular, or semicircular.

**[0020]** Preferably, the channel body is a bent tube or a folded tube.

**[0021]** Preferably, the A channel is a variable-diameter cavity-type channel.

**[0022]** Preferably, an included angle between a flow direction in the A inlet and a flow direction in the A outlet is 30°, 90°, 180°, or 270°.

**[0023]** Preferably, the channel body includes a straight tubular A channel body section and a straight tubular B channel body section located at two ends of the channel body, and the A channel body section and the B channel body section are connected by an arc-shaped C channel body section.

**[0024]** Preferably, a cross section of the A channel body section and a cross section of the B channel body section have the same size, and a cross section of the C channel body section and the cross section of the A channel body section have different sizes.

**[0025]** Preferably, a length of the A channel body section and a length of the B channel body section are different.

**[0026]** Preferably, a thickness of the interlayer forming the cooling passage is 1 mm-10 mm.

**[0080]** Preferably, referring to FIG. 6 to FIG. 15, the A channel 110 is a variable-diameter cavity-type channel. The larger the diameter of the cavity-type channel is, the ~~more smooth~~smoother the transport of the plasma is, which means that more particles can pass. The smaller the diameter is, the better the filtering effect is, which means more impurity components 00b that cannot be controlled by the magnetic field 00d will be trapped. Where the diameter is large or where the diameter is small can be determined according to needs in the actual implementation.

**[0081]** Referring to FIG. 1 to FIG. 15, since the channel body 100 is a bent tube or a folded tube, flow directions of the plasma in the A inlet 120 and the A outlet 130 are inevitably different. Preferably, an included angle between the flow directions in the A inlet 120 and the A outlet 130 is in a range of 30°-270°.

**[0082]** As shown in FIG. 1 to FIG. 15, the included angle between the flow directions in the A inlet 120 and the A outlet 130 is 30°, 90°, 180°, or 270°.

**[0083]** The A inlet 120 and the A outlet 130 usually need to be assembled with and connected to other equipment by using the flange 500 to ensure the sealing performance and stability at the connecting portion. In order to adapt to the arrangement of the flange 500, straight tubes are generally required respectively at two ends of the A channel 110 as transitions, so as to improve the sealing performance, reliability and other process performance of the connecting portion between the flange 500 and the channel body 100. In this regard, a preferred implementation of the embodiment of the present application is as follows. The channel body 100 includes the straight tubular A channel body section 140 and the straight tubular B channel body section 150 that are located at two ends, and the A channel body section 140 and the B channel body section 150 are connected by the arc-shaped C channel body section 160, as shown in FIG. 1 to FIG. 15.

**[0084]** In practice use, referring to FIG. 6 to FIG. 15, the cross sections of the A channel body section 140 and the B channel body section 150 may preferably have the same size. The reason for this implementation is that the plasma generator 900 can also be directly connected to the vacuum chamber 1000 when the plasma transport channel

adsorption performance of the transport channel to the impurity component 00b, and enabling more impurity components 00b to deposit on the inner wall of the transport channel.

**[0098]** If the annular plate 410 is a flat board, in order to maximize the probability of the impurity component 00b depositing on the inner wall of the channel body 100, the distance between two adjacent annular plates 410 must be smaller, or the surface of the annular plate 410 needs to be enlarged. The former will increase cost, and the latter will restrict the channel where the plasma flows, thereby affecting the transport of the plasma in the A channel 110. In this regard, a preferred implementation of the embodiment of the present application is as follows. As shown in FIG. 1 to FIG. 4, the annular plate 410 is in a shape of a side surface of truncated cone, and the distance between the inner ring side 411 of the annular plate 410 and the A inlet 120 is smaller than that between the outer ring side 412 thereof and the A inlet 120. In other words, the surface of the annular plate 410 arranged close to the A inlet 120 is convex outward along the transport direction of the plasma, and the surface of the annular plate 410 arranged close to the A outlet 130 is concave inward along the transport direction of the plasma. Compared with the flat annular plate 410, on the one hand, the assembly distance between two adjacent annular plates 410 is increased while ensuring sufficiently large effective contact area between the plate and the plasma, and the amount of the plates assembled is greatly reduced, thereby saving cost; on the other hand, the inner diameter of the inner ring side of the annular plate 410 is larger, which can give way to the plasma transport to the maximum. In short, it can not only improve the filtering effect, but also minimize the impact on the plasma transport.

**[0099]** The working principle is as follows. As shown in FIG. 1, FIG. 3 and FIG. 4, the side of the cross section of the annular plate 410 and the inner wall of the channel body 100 are arranged at an included angle, that is, the outer surface of the annular plate 410 tilts toward the inner wall of the channel body 100. Further, it can be seen from the figures that the opening of the included angle faces downward, that is, the outer surface of the annular plate 410 is arranged toward the side of the plasma generator. In this way,

CLAIMS

1. A plasma transport channel device, comprising a channel body, wherein an A channel configured for a transport of a plasma is formed inside the channel body, two ends of the A channel constitute an A inlet and an A outlet, respectively, a cooling unit configured for cooling the channel body is arranged on or beside the channel body, and/or, an adsorption unit configured for adsorbing an impurity component in the plasma is arranged on an inner wall of the channel body.

the cooling unit is formed by a cooling passage arranged on the channel body, and a cooling fluid is contained in the cooling passage;

the cooling passage is arranged on an outer side wall of the channel body;

the cooling passage is formed by a spiral tube arranged on the channel body, one end of the spiral tube is a cooling fluid inlet, and the other end of the spiral tube is a cooling fluid outlet.

~~2. The plasma transport channel device according to claim 1, wherein the cooling unit is formed by an air-cooling device arranged outside the channel body.~~

~~3. The plasma transport channel device according to claim 1, wherein the cooling unit is formed by a cooling passage arranged on the channel body, and a cooling fluid is contained in the cooling passage.~~

~~4. The plasma transport channel device according to claim 3, wherein the cooling passage is arranged on an outer side wall of the channel body.~~

~~5. The plasma transport channel device according to claim 4, wherein the cooling passage is formed by an interlayer arranged on the channel body, and a cooling fluid inlet and a cooling fluid outlet are arranged on the cooling passage.~~

~~6. The plasma transport channel device according to claim 4, wherein the cooling~~

~~passage is formed by a spiral tube arranged on the channel body, one end of the spiral tube is a cooling fluid inlet, and the other end of the spiral tube is a cooling fluid outlet.~~

~~7~~2. The plasma transport channel device according to ~~any one of~~ claim~~s~~ 1~~-6~~, wherein the adsorption unit is arranged along a length range of the channel body.

~~8~~3. The plasma transport channel device according to ~~any one of~~ claim~~s~~ 1~~-6~~, wherein the adsorption unit is formed by a plate or a block arranged on the inner wall of the channel body.

~~9~~4. The plasma transport channel device according to ~~any one of~~ claim~~s~~ 1~~-6~~,

wherein the adsorption unit is formed by annular plates arranged on the inner wall of the channel body, a center line of each of the annular plates is consistent with a center line of the channel body, and the annular plates are arranged at intervals along a length direction of the channel body.

~~10~~5. The plasma transport channel device according to claim ~~9~~4, wherein each of the annular plates is in a shape of a side surface of truncated cone, and a distance between an inner ring side of the annular plate and the A inlet is smaller than a distance between an outer ring side thereof and the A inlet.

~~11~~6. The plasma transport channel device according to ~~any one of~~ claim~~s~~ 1~~-6~~, wherein a magnetic field device is arranged beside the channel body, and an intensity of a magnetic field applied by the magnetic field device is 0.01 T-0.98 T.

~~12~~7. The plasma transport channel device according to claim ~~6~~1, wherein a cross section of the spiral tube is circular, rectangular, elliptical, or semicircular.

~~13~~8. The plasma transport channel device according to ~~any one of~~ claim~~s~~ 1~~-6~~,

wherein the channel body is a bent tube or a folded tube.

~~14~~9. The plasma transport channel device according to ~~any one of~~ claim~~s~~ 1~~-6~~, wherein the A channel is a variable-diameter cavity-type channel.

~~15~~10. The plasma transport channel device according to ~~any one of~~ claim~~s~~ 1~~-6~~, wherein an included angle between a flow direction in the A inlet and a flow direction in the A outlet is 30°, 90°, 180°, or 270°.

~~16~~11. The plasma transport channel device according to ~~any one of~~ claim~~s~~ 1~~-6~~, wherein the channel body comprises a straight tubular A channel body section and a straight tubular B channel body section located at two ends of the channel body, and the A channel body section and the B channel body section are connected by an arc-shaped C channel body section.

~~17~~12. The plasma transport channel device according to claim ~~16~~11, wherein a cross section of the A channel body section and a cross section of the B channel body section have the same size, and a cross section of the C channel body section and the cross section of the A channel body section have different sizes.

~~18~~13. The plasma transport channel device according to claim ~~16~~11, wherein a length of the A channel body section and a length of the B channel body section are different.

~~19. The plasma transport channel device according to claim 5, wherein a thickness of the interlayer forming the cooling passage is 1 mm-10 mm.~~

~~20~~14. A coating equipment, comprising the plasma transport channel device according to any one of claims 1-~~9~~4, wherein the coating equipment is one or any

combination of magnetron sputtering equipment, vacuum-arc equipment, chemical vapor deposition equipment and pure ion vacuum coating equipment.