CLAIMS

[Claim 1]

A diffusion bonding heat exchanger comprising:

a core that includes a first heat transfer plate and a second heat transfer plate that are stacked and diffusion-bonded to each other,

wherein the first heat transfer plate includes a high-temperature flow path that includes a plurality of channels having a groove shape provided to be arranged in a flow path width direction and through which a high-temperature fluid flows,

the second heat transfer plate includes a low-temperature flow path through which a low-temperature fluid flows, the low-temperature fluid being a fluid of which a temperature is lower than a freezing point of the high-temperature fluid,

the high-temperature flow path of the first heat transfer plate includes a connection channel portion configured such that the high-temperature fluid flows across the plurality of channels within at least a range that overlaps a predetermined range in a stacking direction, the predetermined range being a range from a flow path inlet of the second heat transfer plate to a position downstream of the flow path inlet,

the low-temperature flow path of the second heat transfer plate includes a first portion that is provided in the predetermined range of the second heat transfer plate and a second portion that is provided downstream of the first portion, and

the first portion is configured such that a heat transfer performance of the first portion is lower than a heat transfer performance of the second portion, due to a difference in shape pattern of channels or in a surface treatment between the first portion and the second portion.

[Claim 2]

The diffusion bonding heat exchanger according to Claim 1,

wherein the connection channel portion is formed over the approximately entire high-temperature flow path in the first heat transfer plate.

[Claim 3]

The diffusion bonding heat exchanger according to Claim 1,

wherein the high-temperature flow path includes the plurality of channels having a linear shape arranged in the flow path width direction, and

in the connection channel portion, a plurality of

connection paths having a groove shape, each of which extends across the channels adjacent to each other such that the channels communicate with each other, are formed.

[Claim 4]

The diffusion bonding heat exchanger according to Claim 3,

wherein the plurality of connection paths are arranged in a zigzag such that positions of the connection paths adjacent to each other in the flow path width direction are offset from each other in a flowing direction of the high-temperature fluid.

[Claim 5]

The diffusion bonding heat exchanger according to Claim 1,

wherein the high-temperature flow path includes the plurality of channels that branch along a plurality of partition walls having an island shape, which are disposed to be scattered in the flow path, and join each other in the connection channel portion.

[Claim 6]

The diffusion bonding heat exchanger according to Claim 1,

wherein the high-temperature flow path includes an overlapping region that overlaps the low-temperature flow path of the second heat transfer plate as seen in plan view and a non-overlapping region that is provided outside the overlapping region at least on the flow path inlet side of the low-temperature flow path.

[Claim 7]

The diffusion bonding heat exchanger according to Claim 1,

wherein the low-temperature flow path includes a plurality of channels having a groove shape through which the low-temperature fluid flows, and

a planar shape of the channels of the first portion is different from a planar shape of the channels of the second portion such that a heat transfer performance of the channels of the first portion is lower than a heat transfer performance of the channels of the second portion.

[Claim 8]

The diffusion bonding heat exchanger according to Claim 1,

wherein the diffusion bonding heat exchanger is a parallel flow heat exchanger in which the high-temperature fluid flowing through the high-temperature flow path and

the low-temperature fluid flowing through the low-temperature flow path flow in the same direction.

[Claim 9]

The diffusion bonding heat exchanger according to Claim 1,

wherein each of the first heat transfer plate and the second heat transfer plate includes a pair of first side end surfaces and a pair of second side end surfaces adjacent to the first side end surfaces,

the high-temperature flow path is formed to extend in a direction along the second side end surfaces from a flow path inlet open at the first side end surface of the first heat transfer plate, and

the low-temperature flow path is formed such that the low-temperature flow path is bent after extending from the flow path inlet open at each of the pair of second side end surfaces of the second heat transfer plate and extends in the direction along the second side end surfaces.