Further, for small-to-medium sized heat exchangers, joining operations are often performed by brazing in view of pressure resistance.

Patent Document 1: Japanese Unexamined Patent Application, Publication No. 2010-85094

Summary:

According to an aspect, a plate-type heat exchange is provided, where a housing of the heat exchanger comprises a plurality of rectangular plate-like components, and the rectangular plate-like components are box-like components each having the same shape and having a standing wall section along a peripheral edge, and one of the box-like components is layered on another of the box-like components reversed in the horizontal direction to form a layered structure having an upper layer component and a lower layer component such that an upper portion of a standing wall section of the lower layer component of the layered structure is fit into a lower portion of a standing wall section of the upper layer component of the layered structure, and the angle (θ) of the standing wall sections is $\theta \leq 30°$, and at least a portion of a contact region between the upper portion of the standing wall section and the lower portion of the standing wall section is joined by solid phase diffusion bonding.

DISCLOSURE OF THE INVENTION

Problems to be Solved by the Invention

However, attempts for layering and joining corrugated plate-like components by brazing may result in joining defects inherent to braze materials, such as erosion and cracks occurring upon joining, decreased corrosion resistance and

buried flow paths with a braze melt. Further, the cost of braze materials is also an issue.

Meanwhile, as a method in which decreased corrosion resistance is prevented at a joining region, solid phase diffusion bonding may be used instead of brazing. Solid phase diffusion bonding is a joining method which takes advantage of interdiffusion of atoms of a base material occurring at a joining interface under high temperature and high pressure, and can produce a joining region having such strength and corrosion resistance comparable to those of the base material. However, the quality of joining by solid phase diffusion may be affected by the applied pressure, temperature and the like at a joining surface.

In particular, in a case where a stainless steel sheet is used as a metal plate material, diffusion bonding of a