[Document Type] CLAIMS

1. A hot-dip plated steel sheet comprising:

a base steel sheet; and

a hot-dip plating layer,

wherein a chemical composition of the hot-dip plating layer contains Al: 4.0 to 22 mass%, Mg: 1 to 10 mass%, Si: 0.060 to 2 mass%, and a remainder consisting of Zn and impurities,

a coating weight of the hot-dip plating layer is in a range of 40 to 600 g/$m^2$ on both surface in total,

a total value of an interface contact length of interface $Mg_2Si$ phases present at an interface between the base steel sheet and the hot-dip plating layer is 20% or less of the visual field, in which the total value is measured in a visual field having a length of 10 mm in a vertical cross section, and

a number density of the interface $Mg_2Si$ phases having an equivalent circle diameter of 30 μm or more present at the interface between the base steel sheet and the hot-dip plating layer is 10 pieces/$mm^2$ or less, in which the number density is measured in a plan view.

2. The hot-dip plated steel sheet according to claim 1,

wherein a maximum value of the interface contact length of the interface $Mg_2Si$ phase is 50 μm or less, in which the maximum value is measured in the visual field having a length of 10 mm in the vertical cross section.

3. The hot-dip plated steel sheet according to claim 1 or 2,

wherein a ratio b/a of a length b of the interface $Mg_2Si$ phase in an interface-horizontal direction to a length a of the interface $Mg_2Si$ phase in a plating-depth direction is 0.1 or more and 10 or less in the visual field having a length of 10 mm in the

vertical cross section.

4. The hot-dip plated steel sheet according to any one of claims 1 to 3,

wherein the chemical composition of the hot-dip plating layer contains 0.001 to 2 mass% of one or more selected from Fe, Sb, Pb, Sn, Ca, Co, Mn, P, B, Bi, Cr, Group 3 elements, REM, and Hf in total, instead of part of the Zn.

5. The hot-dip plated steel sheet according to any one of claims 1 to 4,

wherein the chemical composition of the hot-dip plating layer contains 0.001 to 2 mass% of one or more selected from Ni, Ti, Zr, and Sr in total, instead of part of the Zn.

6. A method of manufacturing a hot-dip plated steel sheet, the method comprising:

alkaline degreasing a base steel sheet using alkaline degreasing liquid containing 0.5 to 5.0 mass% of a surfactant;

water rinsing the base steel sheet after the alkaline degreasing;

annealing the base steel sheet after the water rinsing; and

immersing the base steel sheet in a hot-dip plating bath containing Al: 4.0 to 22 mass%, Mg: 1 to 10 mass%, Si: 0.0001 to 2 mass%, and a remainder consisting of Zn and impurities after the annealing, to form a hot-dip plating layer,

wherein a pH of rinsing water is always set to 8.7 or more and 12 or less in the water rinsing,

the hot-dip plated steel sheet comprises:

a base steel sheet; and

a hot-dip plating layer,

a chemical composition of the hot-dip plating layer contains Al: 4.0 to 22 mass%, Mg: 1 to 10 mass%, Si: 0.0001 to 2 mass%, and a remainder consisting of Zn

and impurities,

a coating weight of the hot-dip plating layer is in a range of 40 to 600 g/$m^2$ on both surface in total,

a total value of an interface contact length of interface $Mg_2Si$ phases present at an interface between the base steel sheet and the hot-dip plating layer is 20% or less of the visual field, in which the total value is measured in a visual field having a length of 10 mm in a vertical cross section, and

a number density of the interface $Mg_2Si$ phases having an equivalent circle diameter of 30 μm or more present at the interface between the base steel sheet and the hot-dip plating layer is 10 pieces/$mm^2$ or less, in which the number density is measured in a plan view.

7. The method of manufacturing the hot-dip plated steel sheet according to claim 6,

wherein the hot-dip plating bath contains 0.001 to 2 mass% of one or more selected from Fe, Sb, Pb, Sn, Ca, Co, Mn, P, B, Bi, Cr, Group 3 elements, REM, and Hf in total, instead of part of the Zn.

8. The method of manufacturing the hot-dip plated steel sheet according to claim 6 or 7,

wherein the hot-dip plating bath contains 0.001 to 2 mass% of one or more of Ni, Ti, Zr, and Sr in total, instead of part of the Zn.