DESCRIPTION

Title of Invention

HOT-DIP ZINC-ALUMINUM ALLOY COATED STEEL SHEET HAVING HIGH CORROSION RESISTANCE AND FORMABILITY AND METHOD FOR PRODUCING THE SAME

Technical Field

The present invention relates to a hot-dip Zn-Al alloy coated steel sheet suitable for use in construction, civil engineering, household electric appliances, etc., and a method for producing the sheet. In particular, it relates to improvements in formability and corrosion resistance of formed portions.

Background Art

In the fields of building materials, household electric appliances, automobiles, etc., hot-dip galvanized steel sheets have been widely used. Hot-dip Zn coated steel sheets applied to such usages are mainly required to exhibit high corrosion resistance. However, for example, in the field of construction, hot-dip galvanized steel sheets are formed into particular shapes and used as parts of roofs, walls, structures, etc., and thus hot-dip galvanized steel sheets for such usages are required to exhibit not only high corrosion resistance but also high formability and,

DESCRIPTION

Title of Invention

MOLTEN ZN-AL-BASED ALLOY-PLATED STEEL SHEET HAVING EXCELLENT CORROSION RESISTANCE AND WORKABILITY, AND METHOD FOR PRODUCING SAME

Technical Field

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Background Art

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CLAIMS

[Claim 1]

A method for producing a hot-dip Zn-Al alloy coated steel sheet having high corrosion resistance and high formability, the method comprising introducing a steel sheet serving as a substrate into a hot-dip Zn-Al alloy coating bath having a composition of Al: 3 to 6%, Mg: 0.2 to 1.0%, Ni: 0.01 to 0.10%, and the balance being Zn and unavoidable impurities in terms of percent by mass, withdrawing the steel sheet therefrom, and cooling the steel sheet to form a hot-dip Zn-Al alloy coating layer on a surface of the steel sheet,

wherein the hot-dip Zn-Al alloy coating bath has an Fe content adjusted to 0.1% or less, a temperature of the hot-dip Zn-Al alloy coating bath is adjusted to be within a range of 420°C to 520°C, and a temperature of the steel sheet upon immersing into the hot-dip Zn-Al alloy coating bath is adjusted to be within a range of 420°C to 600°C but not less than the temperature of the hot-dip Zn-Al alloy coating bath.

[Claim 2]

A hot-dip Zn-Al alloy coated steel sheet having high corrosion resistance and high formability, comprising a steel sheet serving as a substrate and a hot-dip Zn-Al alloy coating layer having a composition of Al: 3 to 6%, Mg: 0.2

to 1.0%, Ni: 0.01 to 0.10%, and the balance being Zn and unavoidable impurities in terms of percent by mass, the hot-dip Zn-Al alloy coating layer being formed on at least one surface of the steel sheet,

wherein the hot-dip Zn-Al alloy coating layer has an Fe content adjusted to 2.0 g/m^2 or less and a Ni-rich layer having a thickness of 0.05 to 1.0 μm lies at the interface between the hot-dip Zn-Al alloy coating layer and the steel sheet.

[Claim 1]

A method for manufacturing a hot-dip Zn-Al-based alloy coated steel sheet having high corrosion resistance and high formability, comprising:

dipping a steel sheet serving as a substrate into a hot-dip Zn-Al-based alloy bath, the hot-dip Zn-Al-based alloy coating bath having a composition containing, by mass%, Al: 3 to 6%, Mg: 0.2 to 1.0%, and Ni: 0.01 to 0.10%, and the balance Zn, and incidental impurities; pulling out; and cooling the steel sheet to form a hot-dip Zn-Al-based alloy coating layer on a surface of the steel sheet,

wherein the hot-dip Zn-Al-based alloy coating bath is a coating bath adjusted to have Fe of equal to or less than 0.1%, and then, the hot-dip Zn-Al-based alloy coating bath is adjusted to have a temperature in a range of 420 to 520°C, the steel sheet to be dipped in the hot-dip Zn-Al-based alloy coating bath is adjusted to have a temperature in a range of 420 to 600°C and equal to or more than the temperature of the hot-dip Zn-Al-based alloy coating bath.

[Claim 2]

A hot-dip Zn-Al-based alloy coated steel sheet having high corrosion resistance and high formability, comprising:

a hot-dip Zn-Al-based alloy coating layer having a composition containing, by mass%, Al: 3 to 6%, Mg: 0.2 to 1.0%, Ni: 0.01 to 0.10%, and the balance being Zn and incidental impurities on at least one surface of a steel sheet serving as a substrate,

wherein the hot-dip Zn-Al-based alloy coating layer is a coating layer adjusted to have Fe of equal to or less than 2.0 g/m^2, and

the hot-dip Zn-Al-based alloy coating layer has a Ni-enriched layer with a thickness of 0.05 to 1.0 μm on an interface between the steel sheet and the hot-dip Zn-Al-based alloy coating layer.